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A STREET & SMITH PUBLICATION

SECOND STAGE LENS MEN

BY E. E. SMITH, PH. D.

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All stories in this magazine are fiction. No actual persons are designated either by name or character. Any similarity is coincidental.

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POWER PER POUND

THE other day I did some calculating on the exact horsepower requirements of a ship intended to climb vertically against the pull of gravity. The results tend to be confusing if related to ordinary engineering terms.

First—considering spaceships—there are two general types conceivable. A ship equipped with antigravity devices need not fight gravity rapidly; it can float upward at whatever low rate it happens to prefer. A ship which fights gravity directly, the type of rocket-powered ship we most often consider, must do it as quickly as possible. Such a ship will, necessarily, use fuel at a terrific rate if it merely hangs still at a given level.

The fuel required for simply hanging suspended will be the same, as far as rate of consumption goes, as that required to maintain an acceleration of one gravity—thirty-two feet per second per second—in free space beyond any appreciable gravitational influences. As in "Alice," you have to run that fast just to stand still. The longer a ship spends in the lower levels of Earth's gravitational field, the more fuel will be used in simply not falling back. Thus, a ship that leaves with an acceleration of ten gravities—using eleven gravities drive, since Earth's pull absorbs one—will waste less fuel fighting Earth's attraction during the period of the start than one that uses a drive of only two gravities and a resultant acceleration of one gravity.

Evidently, a rocket-drive ship should use a driving power sufficient to leave the planet as quickly as the human cargo can stand. Properly strapped, braced, and bebandaged men can stand up to ten gravities total drive for brief—very brief—periods. Probably a total drive of five gravities is the maximum practicable for any period to be measured in minutes. Using five gravities drive, four gravities effective acceleration, five minutes time would put the ship 1,100 miles out from Earth; ten minutes would find it about 4,800 miles out, where the intensity of gravity would have fallen to about one fourth, and a lower drive power would be practical.

Then, for our rocketship drive, we need an engine capable of accelerating a ship at five gravities—one capable of lifting against a pull twice that of Jupiter.

Let's try converting that into terms of horsepower per pound—or per ton, which is more practical. Say we have a small ten-man exploration ship, about as small an expedition as could make a real scientific record of a locality on Mars, say. If a ship capable of sustaining them for five months could be built to weigh less than 100 tons, with engines included, but without fuel, I believe it would represent excellent efficiency. Let's calculate on the basis of 100 tons.

"Five gravities acceleration" promptly causes trouble on the calculation end. Horsepower is calculated on the basis of force exerted through a distance traversed in a unit of time— FS/T . But an accelerating ship goes varying distances in different equally long intervals of time. The first five minutes our ship at five gravities drive covered 1,100 miles; the sec-

Continued on page 125

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SECOND STAGE LENS MEN

By E. E. Smith, Ph.D.

FIRST OF FOUR PARTS. *The long-awaited sequel to "Galactic Patrol" and "Gray Lensman," sweeping across the stage of two immense galaxies, carries on the saga of Civilization's vast fight—*

Illustrated by Rogers

HISTORICAL

LAW enforcement lagged behind crime because the police were limited in their spheres of action, while

criminals were not. Therefore, when Bergenholm invented the inertialess drive and commerce throughout the Galaxy became commonplace, crime

became so rampant as to threaten the very existence of Civilization.

Thus came into being the Galactic Patrol, an organization whose highest members are called "Lensmen." Each is identified by wearing the Lens, a pseudoliving telepathic jewel matched to the ego of its wearer by those master philosophers, the Arisians. The Lens cannot be either imitated or counterfeited, since it glows with color when worn by its owner, and since it kills any other who attempts to wear it.

Of each million selected candidates for the Lens all except about a hundred fail to pass the grueling tests employed to weed out the unfit. Kimball Kinnison graduated No. 1 in his class and was put in command of the spaceship *Brittania*—a war vessel of a new type, using explosives, even though such weapons had been obsolete for centuries. The "pirates"—the Boskonian Conflict was just beginning, so that no one yet suspected that the Patrol faced anything worse than highly organized piracy—were gaining the upper hand because of a new and apparently almost unlimited source of power. Kinnison was instructed to capture one of the new-type pirate ships, in order to learn the secret of that power.

He found and defeated a Boskonian warship. Peter VanBuskirk led the storming party of Valerians—men of human type, but of extraordinary size, strength and agility because of the enormous gravitational force of their home planet—in wiping out those of the pirate crew not killed in the battle between the two ships.

The scientists of the expedition secured the information desired. It could not be transmitted to Prime Base, however, because the pirates blanketed all channels of communication. Boskonian warships were

gathering, and the crippled *Brittania* could neither run nor fight. Therefore each man was given a spool of tape bearing the data and all the Patrolmen took to the lifeboats.

Kinnison and VanBuskirk, in one of the boats, were forced to land upon the planet Delgon, where they joined forces with Worsel—later to become Lensman Worsel—a winged, reptilian native of a neighboring planet, Velantia. The three destroyed a number of the Overlords of Delgon, a sadistic race of monsters who preyed upon the other races of their solar system by sheer power of mind. Worsel accompanied the Patrolmen to Velantia, where all the resources of the planet were devoted to preparing defenses against the expected Boskonian attack. Several others of the *Brittania's* lifeboats reached Velantia, called by Worsel's prodigious mind working through Kinnison's ego and Lens.

Kinnison finally succeeded in tapping a communicator beam, thus getting one line upon Helmuth, who "spoke for Boskone"—it was supposed then that Helmuth actually was Boskone instead of a comparatively unimportant Director of Operations—and upon his Grand Base.

The Boskonians attacked Velantia and six of their vessels were captured. In these ships, manned by Velantian crews, the Tellurians set out for Earth and the Prime Base of the Galactic Patrol. Kinnison's Bergenholm, the generator of the force which makes inertialess—"free," in space parlance—flight possible, broke down, wherefore he had to land upon the planet Trencu for repairs.

Trencu, the tempestuous, billiard ball-smooth planet where it rains forty-seven feet and five inches every

night and where the wind blows eight hundred miles an hour. Trencu, the world upon which is produced thionite, the deadliest and most potent of all habit-forming drugs. Trencu, the Mecca of all the "zwilniks"—members of the Boskonian drug ring; sometimes loosely applied to any Boskonian—of the Galaxy. Trencu, whose weirdly charged ether and atmosphere so distort beams and vision that it can be policed only by such beings as the Rigellians, who possess the sense of perception instead of sight and hearing!

Lensman Tregonsee, of Rigel IV, then in command of the Patrol's wandering base upon Trencu, furnished Kinnison a new Bergenholm and he again set out for Tellus.

Meanwhile Helmuth, the Boskonian commander, had deduced that some one particular Lensman was back of all his setbacks; and that the Lens, a complete enigma to the Boskonians, was in some way connected with Arisia. That planet had always been dreaded and shunned by all spacemen. No one would ever say why, but no being who had ever approached that planet uninvited could be compelled, even by threat of death, to go near it again.

Helmuth, thinking himself secure by virtue of his thought-screens, the secret of which he had stolen from Velantia, went alone to Arisia, to learn how the Lens gave its wearer such power. He was stopped at the barrier. His thought-screens were useless—the Arisians had given them to Velantia, hence knew how to break them down. He was punished to the verge of insanity, but was finally permitted to return to his Grand Base, alive and sane: "Not for your own good, but for the good of that struggling young civilization which you oppose."

KINNISON finally reached Prime Base with the all-important data. By building superpowerful battle-ships, called "maulers," the Patrol gained a temporary advantage over Boskonian, but a stalemate soon ensued. Kinnison developed a plan of action whereby he hoped to locate Helmuth's Grand Base; and asked Port Admiral Haynes, Chief of Staff of the entire Patrol, for permission to follow it. In lieu of that, however, Haynes informed him that he had been given his Release; that he was an Unattached Lensman—a "Gray" Lensman, popularly so called, from the color of the plain leather uniforms they wear. Thus he earned the highest honor which the Galactic Patrol can bestow, for the Gray Lensman works under no direction whatever. He is as absolutely a free agent as it is possible to be. He is responsible to no one; to nothing save his own conscience. He is no longer of Tellus, nor of the Solarian System, but of the Universe as a whole. He is no longer a cog in the immense machine of the Patrol: wherever he may go, throughout the unbounded reaches of space, he is the Patrol!

In quest of a second line upon Grand Base, Kinnison scouted a pirate stronghold upon Aldebaran I. Its personnel, however, were not even near-human, but were Wheelmen, possessed of the sense of perception; hence Kinnison was discovered before he could accomplish anything and was very seriously wounded. He managed to get back to his speedster and to send a thought to Port Admiral Haynes, who immediately rushed ships to his aid. In Base Hospital, Surgeon General Lacy put him together, and, during a long and quarrelsome convalescence, Nurse Clarrissa MacDougall held him together. Lacy and Haynes

connived to promote a romance between nurse and Lensman.

As soon as he could leave the hospital he went to Arisia in the hope that he might be permitted to take advanced training; an unheard-of idea. Much to his surprise, he learned that he had been expected to return, for exactly such training. Getting it almost killed him, but he emerged infinitely stronger of mind than any man had ever been before. He also now had the sense of perception; a sense somewhat analogous to that of sight, but of vastly greater penetration, power and scope and not dependent upon light; a sense only vaguely forecast by ancient work upon clairvoyance.

By the use of his new mental equipment he succeeded in entering a Boskonian base upon Boyssia II. There he took over the mind of the communications officer and waited. A pirate ship working out of that base captured a hospital ship of the Patrol and brought it in. Clarrissa, now chief nurse of the captured vessel, working under Kinnison's instructions, stirred up trouble. Helmuth, from Grand Base, interfered, thus enabling the Lensman to get his second, all-important line.

The intersection of the two lines, Boskonian's Grand Base, lay in a star cluster well outside the Galaxy. Pausing only long enough to destroy the Wheelmen of Aldebaran I, the project in which his first attempt had failed so dismally, he investigated Helmuth's headquarters. He found fortifications impregnable to any massed attack of the Patrol, manned by beings wearing thought-screens. His sense of perception was suddenly cut off—the enemy had thrown a thought-screen around the whole planet.

He returned to Prime Base, deciding en route that boring from within

was the only possible way in which that base could be reduced. In consultation with Haynes the zero hour was set, at which the Grand Fleet of the Patrol would start raying Helmuth's base with every available projector.

Pursuant to his plan, Kinnison again visited Trengo, where Tregonsee and his Rigellians extracted for him fifty kilograms of thionite, the noxious drug which, in microgram inhalations, makes the addict experience all the physical and mental sensations of doing whatever it is that he wishes most ardently to do. The larger the dose the more intense the sensations—but the slightest overdose means a sudden and super-ecstatic death.

Thence to Helmuth's planet; where, by controlling the muscles of a dog whose brain was unscreened, he let himself into the central dome. Here, just before zero time, he released his thionite into the primary air stream, thus wiping out all the pirate personnel except Helmuth; who, in his inner dome, could not be affected. The Patrol attacked on schedule. Kinnison killed Helmuth in hand-to-hand combat. Grand Base was blasted out of existence, largely by the explosion of bombs of duodecapyl atomate placed by the pirates themselves. These bombs were detonated by an enigmatic, sparkling force-ball which Kinnison had studied with care. He knew that it was operated by thought, and he suspected—correctly—that it was in reality an intergalactic communicator.

KINNISON'S SEARCH for the real Boskone leads to Lundmark's Nebula, thenceforth called the Second Galaxy. His ship, the super-powerful *Dauntless*, met and defeated a squadron of Boskonian war-

ships. The Tellurians landed upon the planet Medon, whose people were fighting a losing war against the forces of Boskone. The Medonians, electrical wizards who had been able to install inertia-neutralizers and a space drive upon their planet, moved their world over to our First Galaxy.

With the cessation of military activity, however, the illicit traffic in habit-forming drugs amongst all races of warm-blooded oxygen breathers had increased tremendously; and Kinnison, deducing that Boskone was back of the Drug Syndicate, decided that the best way to find the real leader of the enemy was to work upward through the drug ring.

Disguised as a dock walloper, he frequented the saloon of a drug baron, and helped to raid it; but, although he secured much information, his disguise was penetrated.

He called a Conference of Scientists, to devise means of building a gigantic bomb of negative matter. Then, impersonating a Tellurian secret-service agent who lent himself to the deception, he tried to investigate the stronghold of Prellin of Bronseca, one of Boskone's Regional Directors. This disguise also failed and he barely escaped.

Ordinary disguises having proved useless against Boskone's clever agents, Kinnison himself became Wild Bill Williams; once a gentleman of Aldebaran II, now a space rat meteor miner. Instead of pretending to drink he really drank; making of himself a practically bottomless drinker of the most vicious beverages known to space. He became a drug fiend—a bentlam eater—discovering that his Arisian-developed mind could function at full efficiency even while his physical body was stupefied. He became widely known as the fastest, deadliest performer with

twin ray guns that had ever struck the asteroid belts. Thus, through solar system after solar system, he built up an unimpeachable identity as a hard-drinking, wildly carousing, bentlam-eating, fast-shooting space hellion; a lucky or a very skillful meteor miner; a derelict who had been an Aldebaranian gentleman once and who would be again if he should ever strike it rich and if he could conquer his weaknesses.

Physically helpless in a bentlam stupor, he listened in on a zwilnik conference and learned that Edmund Crowninshield, of Tressilia III, was also a Regional Director of the enemy.

Boskone formed an alliance with the Overlords of Delgon, and through a hyperspatial tube or vortex the combined forces again attacked humanity. Not simple slaughter this time, for the Overlords tortured their captives and consumed their life forces in sadistic orgies. The Conference of Scientists solved the mystery of the tube and the *Dauntless* attacked through it; returning victorious.

Wild Bill Williams struck it rich at last. Forthwith he abandoned the low dives in which he had been wont to carouse, and made an obvious effort to become again an Aldebaranian gentleman. He secured an invitation to visit Crowninshield's resort. The Boskonian, believing that Williams was basically a drink and drug-soaked bum, took him in, to get his quarter-million credits. Relapsing into a characteristically wild debauch, Kinnison-Williams did squander a large part of his new fortune; but he learned from Crowninshield's mind that one Jalte, a Kalonian by birth, was Boskone's Galactic Director and that Jalte had his headquarters in a star cluster just outside the First Galaxy. Pre-

tending bitter humiliation and declaring that he would change his name and disappear, the Gray Lensman left the planet—to investigate Jalte's base.

He learned that Boskone was not a single entity, but was a council. He also learned that, while the Kalonian did not know who or where Boskone was, Eichmil, Jalte's superior, who lived upon the planet Jarnevon in the Second Galaxy, would probably know all about it.

KINNISON and Worsel, therefore, set out to investigate Jarnevon. Kinnison was captured and tortured—there was at least one Delgonian upon Jarnevon—but Worsel rescued him before his mind was damaged and brought him back to the Patrol's Grand Fleet with his knowledge intact. Jarnevon was populated by the Eich, a race of monsters as bad as the Overlords of Delgon; the Council of Nine which ruled the noisome planet was, in fact, the long-sought, the utterly detested Boskone!

The greatest surgeons of the age—Phillips of Posenia and Wise of the newly acquired planet Medon—demonstrated that they could grow new nervous tissue; even new limbs and organs if necessary.

Again Clarrissa MacDougall nursed Kinnison back to health, and this time the love between them would not be denied.

The Grand Fleet of the Patrol was assembled, and with Kinnison in charge of Operations, swept outward from the First Galaxy. Jalte's planet was destroyed by means of the negasphere—the negative-matter bomb. Then on to the Second Galaxy.

There the Patrol forces destroyed Jarnevon, the planet of the Eich, by smashing it between two barren planets which had been driven there

in the "free"—inertialess—condition. These planets, having opposite intrinsic velocities, were placed one upon each side of Jarnevon. Then their Bergenholms were cut, restoring inertia and intrinsic velocity; and when that frightful collision was over a minor star had come into being.

Grand Fleet returned to our Galaxy. Galactic Civilization rejoiced. Earth in particular made merry, and Prime Base was the center of celebration. And in Prime Base Kinnison, supposing that the war was over and that his problem was solved, threw off his Gray Lensman's burden and forgot all about the Boskonian menace. Marrying his Chris, he declared, was the most important thing in the Universe.

But how wrong he was! For, even as Lensman and Sector Chief Nurse were walking down a hallway of Base Hospital after a conference with Lacy and Haynes regarding that marriage—

I.

"STOP, YOUTH!" The voice of that nameless, incredibly ancient Arisian who was Kinnison's instructor and whom he had thought of and spoken of simply as "Mentor" thundered silently, deep within the Lensman's brain.

He stopped convulsively, almost in midstride, and at the rigid, absent awareness in his eyes Nurse MacDougall's face went white.

"This is not merely the loose and muddy thinking of which you have all too frequently been guilty in the past," the deeply resonant, soundless voice went on, "it is simply not thinking at all. At times, Kinnison of Tellus, we almost despair of you. Think, youth, *think!* For know, Lensman, that upon the clarity of your thought and upon the trueness

of your perception depends the whole future of your Patrol and of your Civilization; more so now by far than at any time in the past."

"Wha'dy'mean, 'think'?" Kinnison snapped back, thoughtlessly. His mind was a seething turmoil, his emotions an indescribable blend of surprise, puzzlement and incredulity.

For moments, as Mentor did not reply, the Gray Lensman's mind raced.

Incredulity—becoming tinged with apprehension—turning rapidly into rebellion.

"Oh, Kim!" Clarrissa choked. A queer-enough tableau they made, these two, had any been there to see; the two uniformed figures standing there so strainedly, the nurse's two hands gripping those of the Lensman. She, completely en rapport with him, had understood his every fleeting thought. "Oh, Kim! They can't do that to us—"

"I'll say they can't!" Kinnison flared. "By Klono's tungsten teeth, I won't do it! We have a right to happiness, you and I, and we'll—"

"We'll what?" she asked, quietly. She knew what they had to face; and, strong-souled woman that she was, she was quicker to face it squarely than was he. "You were just blasting off, Kim, and so was I."

"I suppose so," glumly. "Why in all the nine hells of Valeria did I have to be a Lensman? Why couldn't I have stayed a—"

"Because you are you," the girl interrupted, gently. "Kimball Kinnison, the man I love. You couldn't do anything else." Chin up, she was fighting gamely. "And if I rate Lensman's Mate I can't be a sissy, either. It won't last forever, dear. Just a little longer to wait, that's all."

Eyes, steel-gray now, stared down into eyes of tawny, gold-flecked bronze. "QX, Chris? Really QX?"

What a world of meaning there was in that cryptic question!

"Really, Kim." She met his stare unflinching. If not entirely unafraid, at least with wholehearted determination. "On the beam and on the green, Gray Lensman, all the way. Every long, last millimeter. There, wherever it is—to the very end of whatever road it has to be—and back again. Until it's over. I'll be here. Or somewhere, Kim. Waiting."

The man shook himself and breathed deep. Hands dropped apart—both knew consciously as well as subconsciously that the less of physical demonstration the better for two such natures as theirs—and Kimball Kinnison, Unattached Lensman, came to grips with his problem.

He began really to think; to think with the full power of his prodigious mind; and as he did so he began to see what the Arisian could have—what he must have—meant. He, Kennison, had gummed up the works. He had made a colossal blunder in the Boskonian campaign. He knew that the Brain, although silent, was still en rapport with him; and as he coldly, grimly, thought the thing through to its logical conclusion he knew, with a dull, sick certainty, what was coming next. It came:

"Ah, you perceive at last some portion of the truth. You see that your confused, superficial thinking has brought about almost irreparable harm. I grant that, in specimens so young of such a youthful race, emotion has its place and its function; but I tell you now in all solemnity that for you the time of emotional relaxation has not yet come. *Think, youth—THINK!*" and the ancient sage of Arisia snapped the telepathic line.



As one, without a word, nurse and Leusman retraced their way to the room they had left so shortly before. Port Admiral Haynes and Surgeon General Lacy still sat upon the nurse's davenport, scheming roseate schemes having to do with the wedding they had so subtly engineered. "Back so soon? Forget something, MacDougall?" Lacy asked, amiably. Then, as both men noticed the couple's utterly untranslatable expression:

"What happened? Break it out, Kim!" Haynes commanded.

"Plenty, chief," Kinnison answered, quietly. "Mentor—my Arisian, you know—stopped us before we got to the elevator. Told me that I'd put my foot in it clear up

to the hip joint on that Boskonian thing. That instead of being all buttoned up, my fool blundering has put us further back than we were when we started."

"Mentor!"

"Your Arisian!"

"Told you!"

"Put us back!"

It was an entirely unpremeditated, unconscious duet. The two old officers were completely dumfounded. Arisians never had come out of their shells, they never would. Infinitely less disturbing would have been the authentic tidings that a brick house had fallen upstairs. They had nursed this romance along so carefully, had timed it so exactly, and now it had gone *p-f-f-t*—it had

been taken out of their hands entirely. That thought flashed through their minds first. Then, as catastrophe follows lightning's flash, the real knowledge exploded within their consciousnesses that, in some unguessable fashion or other, the whole Boskonian campaign had gone *p-f-f-f-t*, too.

Port Admiral Hayes, master tactician, reviewed in his keen strategist's mind every phase of the recent struggle, without being able to find a flaw in it.

"There wasn't a loophole anywhere," he said aloud. "Where did they figure we slipped up?"

"We didn't slip—I slipped," Kinnison stated, flatly. "When we took Bominger—the fat Chief Zwiłnik of Radelix, you know—I took a bop on the head to learn that Boskone had more than one string per bow. Observers, independent, for every station at all important. I learned that fact thoroughly then, I thought. At least, we figured on Boskone's having lines of communication past, not through, his Regional Directors, such as Prellin of Bronseca. Since I changed my line of attack at that point, I did not need to consider whether or not Crowninshield of Tressilia III was by-passed in the same way; and when I had worked my way up through Jalte in his star cluster to Boskone itself, on Jarnevon, I had forgotten the concept completely. Its possibility did not even occur to me. That is where I fell down."

"I still don't see it!" Haynes protested. "Boskone was the top!"

"Yeah?" Kinnison asked, pointedly. "That's what I thought—but prove it."

"Oh." The Port Admiral hesitated. "We had no reason to think otherwise—looked at it in that light, this intervention would seem to be

conclusive—but before that there were no—"

"There were so," Kinnison contradicted, "but I didn't see them then. That's where my brain went sour; I should have seen them. Little things, mostly, but significant. Not so much positive as negative indices. Above all, there was nothing whatever to indicate that Boskone actually was the top. That idea was the product of my own wishful and very low-grade thinking, with no basis or foundation in fact or in theory. And now," he concluded bitterly, "because my skull is so thick that it takes an idea a hundred years to filter through it—because a sheer, bare fact has to be driven into my brain with a Valerian maul before I can grasp it—we're sunk without a trace."

"Wait a minute, Kim, we aren't sunk yet," the girl advised, shrewdly. "The fact that, for the first time in history, an Arisian has taken the initiative in communicating with a human being, means something big—*really* big. Mentor does not indulge in what he calls 'loose and muddy' thinking. Every part of every thought he sent carries meaning—plenty of meaning."

"What do you mean?" As one, the three men asked substantially the same question; the Lensman, by virtue of his faster reactions, being perhaps half a syllable in the lead.

"I DON'T KNOW, exactly," Clarrissa admitted. "I've got only an ordinary mind, and it's firing on half its jets or less right now. But I do know that his thought was 'almost' irreparable, and that he meant precisely that—nothing else. If it had been wholly irreparable he not only would have expressed his thought that way, but he would have stopped you before you destroyed Jarnevon.

I know that. Apparently it would have become wholly irreparable if we had got—" she faltered, blushing, then went on, "—if we had kept on about our own personal affairs. That's why he stopped us. We can win out, he meant, if you keep on working. It's your oyster, Kim—it's up to you to open it. You can do it, too—I just know that you can."

"But why didn't he stop you before you fellows smashed Boskone?" Lacy demanded, exasperated.

"I hope you're right, Chris—it sounds reasonable," Kinnison said, thoughtfully. Then, to Lacy:

"That's an easy one to answer, doctor. Because knowledge that comes the hard way is knowledge that really sticks with you. If he had drawn me a diagram before, it wouldn't have helped, the next time I get into a jam. This way it will. I've got to learn how to think, if it cracks my skull.

"*Really* think," he went on, more to himself than to the other three. "To think so that it counts."

"Well, what are we going to do about it?" Haynes was—he had to be, to get where he was and to stay where he was—quick on the uptake. "Or, more specifically, what are you going to do and what am I going to do?"

"What I am going to do will take a bit of mulling over," Kinnison replied, slowly. "Find some more leads and trace them up, is the best that occurs to me right now. Your job and procedure are rather clearer. You remarked out in space that Boskone knew that Tellus was very strongly held. That statement, of course, is no longer true."

"Huh?" Haynes half pulled himself up from the davenport, then sank back. "Why?" he demanded.

"Because we used the negasphere

—a negative-matter bomb of planetary antimass—to wipe out Jalte's planet, and because we smashed Jarnevon between two colliding planets," the Lensman explained, concisely. "Can the present defenses of Tellus cope with either one of those offensives?"

"I'm afraid not—no," the port admiral admitted. "But—"

"We can admit no 'buts,' admiral," Kinnison declared, with grim finality. "Having used those weapons, we must assume that the Boskonian scientists—we'll have to keep on calling them 'Boskonians,' I suppose, until we find a truer name—had recorders on them and have now duplicated them. Tellus must be made safe against anything that we have ever used; against, as well, everything that, by the wildest stretch of the imagination, we can conceive of the enemy using."

"You're right—I can see that," Haynes nodded.

"We have been underestimating them right along," Kinnison went on. "At first we thought that they were merely organized outlaws and pirates. Then, when it was forced upon us that they could match us—overmatch us in some things—we still would not admit that they must be as large and as widespread as we are—galactic in scope. We know now that they were wider-spread than we are. Intergalactic. They penetrated into our Galaxy, riddled it, before we knew even that theirs was inhabited or inhabitable. Right?"

"To a hair, although I never thought of it in exactly that way before."

"None of us have—mental cowardice. And they have the advantage," Kinnison continued, inexorably, "in knowing that our Prime Base is upon Tellus; whereas, if Jarnevon

was not in fact theirs, we have no idea whatever where it is. And another point. Does that fleet of theirs, as you look back on it, strike you as having been a planetary outfit?"

"Well, Jarnevon was a big planet, and the Eich were a mighty warlike race."

"Quibbling a bit, aren't you, chief?"

"Uh-huh," Haynes admitted, somewhat sheepishly. "The probability is very great that no one planet either built or maintained that fleet."

"And that leads us to expect what?"

"Counterattack. In force. Everything they can shove this way. However, they've got to rebuild their fleet, besides designing and building the new stuff. We'll have time enough, probably, if we get started right now."

"But, after all, Jarnevon *may* have been their vital spot," Lacy submitted.

"Even if that were true, which it probably isn't," the now thoroughly convinced port admiral sided in with Kinnison, "it doesn't mean a thing, Sawbones. If they should blow Tel-lus out of space, it wouldn't kill the Galactic Patrol. It would hurt it, of course, but it wouldn't cripple it seriously. The other planets of Civilization could, and certainly would, go ahead with it."

"My thought exactly," from Kinnison. "I check you to the proverbial nineteen decimals."

"Well, there's a lot to do and I'd better be getting at it," and Haynes and Lacy got up to go. Gone now was all thought of demerits or of infractions of rules—each knew what a wrenching the young couple had undergone. "See you in my office when convenient?"

AST—2n

"I'll be there directly, chief—as soon as I tell Chris, here, good-by."

AT ABOUT the same time that Haynes and Lacy went to Nurse MacDougall's room, Worsel the Velantian arrowed downward through the atmosphere toward a certain flat roof. Leather wings shot out with a snap and in a blast of wind—Velantians can stand eleven Tellurian gravities—he came in to his customary appalling landing and dived unconcernedly down a nearby shaft. Into a corridor, along which he wriggled blithely to the office of his old friend, Master Technician LaVerne Thorndyke.

"Verne, I have been thinking," he announced, as he coiled all but about six feet of his sinuous length into a tight spiral upon the rug and thrust out half a dozen weirdly stalked eyes.

"That's nothing new," Thorndyke countered. No human mind can sympathize with or even remotely understand the Velantian passion for solid weeks of intense, uninterrupted concentration upon a single thought. "What about this time? The whichness of the why?"

"That is the trouble with you Tellurians," Worsel grumbled. "Not only do you not know how to think, but you—"

"Hold on!" Thorndyke interrupted, unimpressed. "If you've got anything to say, old snake, why not say it? Why circumnavigate all the stars in space before you get to the point?"

"I have been thinking about thought—"

"So what?" The technician decided. "That's even worse. That's a dizzy spiral if there ever was one."

"Thought—and Kinnison," Worsel declared, with finality.

"Kinnison? Oh—that's different.

I'm interested—very much so. Go ahead."

"And his weapons. His DeLameters, you know."

"No, I don't know, and you know that I don't know. What about them?"

"They are so . . . so . . . so obvious." The Velantian finally found the exact thought he wanted. "So big, and so clumsy, and so obtrusive. So inefficient, so wasteful of power. No subtlety—no finesse."

"But that's far and away the best hand weapon that has ever been developed!" Thorndyke protested.

"True. Nevertheless, a millionth of that power, properly applied, could be at least a million times as deadly."

"How?" The Tellurian, although shocked, was dubious.

"I have reasoned it out that thought, in any organic being, is and must be connected with one definite organic compound—this one," the Velantian explained didactically, the while there appeared within the technician's mind the space formula of an incredibly complex molecule; a formula which seemed to fill not only his mind, but the entire room as well. "You will note that it is a large molecule, and one of high molecular weight. Thus it is comparatively unstable. A vibration at the resonant frequency of any one of its component groups would break it down, and thought would therefore cease."

It took perhaps a minute for the full import of the ghastly thing to sink into Thorndyke's mind. Then, every fiber of him flinching from the idea, he began to protest.

"But he doesn't need it, Worsel. He's got a mind already that can—"

"It takes much mental force to kill," Worsel broke in, equably. "By that method one can slay only a few

at a time, and it is exhausting work. My proposed method would require only a minute fraction of a watt of power and scarcely any mental force at all."

"And it would *kill*—it would have to. That reaction could not be made reversible."

"Certainly," Worsel concurred. "I never could understand why you soft-headed, soft-hearted, soft-bodied human beings are so reluctant to kill your enemies. What good does it do merely to stun them?"

"QX—skip it." Thorndyke knew that it was hopeless to attempt to convince the utterly unhuman Worsel of the fundamental rightness of human ethics. "But nothing has ever been designed small enough to project such a wave."

"I realize that. Its design and construction will challenge your inventive ability. Its smallness is its great advantage. He could wear it in a ring, in the bracelet of his Lens; or, since it will be actuated, controlled, and directed by thought, even imbedded surgically beneath his skin."

"How about backfires?" Thorndyke actually shuddered. "Projection—shielding—"

"Details—mere details," Worsel assured him, with an airy flip of his scimitared tail.

"That's nothing to be running around loose," the man argued. "Nobody could tell what killed them, could they?"

"Probably not." Worsel pondered briefly. "No. Certainly not. The substance must decompose in the instant of death, from any cause. And it would not be 'loose,' as you think; it should not become known, even. You would make only the one, of course."

"Oh. You don't want one, then?"

"Certainly not. What do I need

of such a thing? Kinnison only—and only for his protection.”

“Kim can handle it—but he’s the only being this side of Arisia that I’d trust with one. QX, give me the dope on the frequency, wave form, and so on, and I’ll see what I can do.”

II.

PORT ADMIRAL HAYNES, newly chosen President of the Galactic Council and by virtue of his double office probably the most powerful being in the First Galaxy, set instantly into motion the vast machinery which would make Tellus safe against any possible attack. He first called together his Board of Strategy; the same keen-minded tacticians who had helped him plan the invasion of the Second Galaxy and the eminently successful attack upon Jarnevon. Should Grand Fleet, many of whose component fleets had not yet reached their home planets, be recalled? Not yet—lots of time for that. Let them go home for a while first. The enemy would have to rebuild before they could attack, and there were many more pressing matters.

Scouting was most important. The planets near the galactic rim could take care of that. In fact, they should concentrate upon it, to the exclusion of everything else of warfare’s activities. Every approach to the Galaxy—yes, the space between the two galaxies and as far into the Second Galaxy as it was safe to penetrate—should be covered as with a blanket. That way, they could not be surprised.

Kinnison, when he heard that, became vaguely uneasy. He did not really have a thought; it was as though he should have had one, but didn’t. Deep down, far off, just barely above the threshold of per-

ception an indefinite, formless something obtruded itself upon his consciousness. Tug and haul at it as he would, he could not get the drift. There was *something* he ought to be thinking of, but what in all the iridescent hells from Vandemar to Alsakan was it? So, instead of flitting about upon his declared business, he stuck around; helping the General Staff—and thinking.

And Defense Plan GBT went from the idea men to the draftsmen, then to the engineers. This was to be, primarily, a war of planets. Ships could battle ships, fleets fleets; but, postulating good tactics upon the other side, no fleet, however armed and powered, could stop a planet. That had been proved. A planet had a mass of the order of magnitude of one times ten to the twenty-fifth kilogram, and an intrinsic velocity of somewhere around forty kilometers per second. A hundred probably, relative to Tellus, if the planet came from the Second Galaxy. Kinetic energy, roughly, about five times ten to the forty-first ergs. No, that was nothing for any possible fleet to cope with.

Also, the attacking planets would of course be inertialess until the last strategic instant. Very well, they must be made inert prematurely, when the Patrol wanted them that way, not the enemy. How? The Bergenholms upon those planets would be guarded with everything the Boskonians had.

The answer to that question, as worked out by the engineers, was something they called a “super-mauler.” It was gigantic, cumbersome and slow; but little faster, indeed, than a free planet. It was like Helmuth’s fortresses of space, only larger. It was like the special defense cruisers of the Patrol, except that its screens

were vastly heavier. It was like a regular mauler, except that it had only one weapon. All of its incomprehensible mass was devoted to one thing—*power!* It could defend itself; and, if it could get close enough to its objective, it could do plenty of damage—its dreadful primary was the first weapon ever developed capable of cutting a Q-type helix squarely in two.

And in various solar systems, uninhabitable and worthless planets were converted into projectiles. Dozens of them, possessing widely varying masses and intrinsic velocities. One by one they flitted away from their parent suns and took up positions—not too far away from our Solar System, but not too near.

And finally Kinnison, worrying at his tantalizing thought as a dog worries a bone, crystallized it. Prosai- cally enough, it was an extremely short and flamboyantly waggling pink shirt which catalyzed the reaction; which acted as the seed of the crystallization. Pink—a Chicklo- darian—Xylpic the Navigator—Overlords of Delgon. Thus flashed the train of thought, culminating in:

"Oh, so *that's* it!" he exclaimed, aloud. "That's IT, as sure as hell's a man trap!" He whistled raucously at a taxi, took the wheel himself, and broke—or at least bent—most of the city's traffic ordinances in getting to Haynes' office.

THE port admiral was always busy, but he was never too busy to see Gray Lensman Kinnison; especially when the latter demanded the right of way in such terms as he used then.

"The whole defense set-up is screwy," Kinnison stated, baldly and at once. "I thought from the first that I was overlooking a bet, but I couldn't locate it. Why should

they fight their way through intergalactic space and through sixty thousand parsecs of planet-infested galaxy when they don't have to?" he demanded. "Think of the length of the supply line, with our bases placed to cut it in a hundred places, no matter how they route it. It doesn't make sense. They'd have to outweigh us in an almost impossibly high ratio, unless they have an improbably superior armament."

"Check." The old warrior was entirely unperturbed. "Surprised that you didn't see that long ago. We did. We do not believe that they are going to attack at all."

"But you're going ahead with all this just as though—"

"Certainly. Something *may* happen, and we can't be caught off guard. Besides, it's good training for the boys. Helps morale, no end." Haynes' nonchalant air disappeared and he studied the younger man keenly for moments. "But Mentor's warning certainly meant something, and you said 'when they don't have to.' But even if they go clear around the Galaxy to the other side—an impossibly long haul—we're covered. Tellus is near enough to the center of this galaxy so that they can't possibly take us by surprise. So—spill it!"

"How about a hyperspatial tube? They know exactly where we are, you know."

"Hm-m-m!" Haynes was taken aback. "Never thought of it—possible, distinctly a possibility. A duodec bomb, say, just far enough underground—"

"Nobody else thought of it, either, until just now," Kinnison broke in. "However, I'm not afraid of duodec—don't see how they could control it accurately enough at this three-dimensional distance. Too deep, it wouldn't explode at all.

What I don't like to think of, though, is a negasphere. Or a planet, perhaps."

"Ideas? Suggestions?" the admiral snapped.

"No—I don't know anything about the stuff. How about putting our Lenses on Cardynge?"

"That's a thought!" and in seconds they were in communication with Sir Austin Cardynge, Earth's mightiest mathematical brain.

"Kinnison, how many times must I tell you that I am not to be interrupted?" the aged scientist's thought was a crackle of fury. "How can I concentrate upon vital problems if every young whippersnapper in the System is to perpetrate such abominable, such outrageous intrusions—"

"Hold it, Sir Austin—hold everything!" Kinnison soothed. "I'm sorry. I wouldn't have intruded if it hadn't been a matter of life or death. But it would be a worse intrusion, wouldn't it, if the Boskonians sent a planet about the size of Jupiter—or a negasphere—through one of their extradimensional vortices into your study? That's exactly what they're figuring on doing."

"What . . . what . . . what?" Cardynge snapped, like a string of firecrackers. He quieted down, then, and thought. And Sir Austin Cardynge *could* think, upon occasion and when he felt so inclined; could think in the abstruse symbology of pure mathematics with a cogency equaled by few minds in the Universe. Both Lensmen perceived those thoughts, but neither could understand or follow them. No mind not a member of the Conference of Scientists could have done so.

"They can't!" of a sudden the mathematician cackled, gleefully disdainful. "Impossible—quite defi-

nitely impossible. There are laws governing such things, Kinnison, my impetuous and ignorant young friend. The terminus of the necessary hypertube could not be established within such proximity to the mass of the Sun. This is shown by—"

"Never mind the proof—the fact is enough," Kinnison interposed, hastily. "How close to the Sun could it be established?"

"I couldn't say, offhand," came the cautiously scientific reply: "More than two astronomical units, certainly, but the computation of the exact distance would require some little time. It would, however, be an interesting, if minor, problem. I will solve it for you, if you like, and advise you of the exact minimum distance."

"Please do so—thanks a million," and the Lensmen disconnected.

"THE conceited old goat!" Haynes snorted. "I'd like to smack him down!"

"I've felt like it more than once, but it wouldn't do any good. You've got to handle him with gloves—besides, you can afford to make concessions to a man with a brain like that."

"I suppose so. But how about that infernal tube? Knowing that it cannot be set up within or very near Tellus helps some, but not enough. We've got to know where it is—if it is. Can you detect it?"

"Yes. That is, I can't, but the specialists can, I think. Wise of Medon would know more about that than anyone else. Why wouldn't it be a thought to call him over here?"

"It would that"; and it was done.

Wise of Medon and his staff came, conferred and departed.

Sir Austin Cardynge solved his minor problem, reporting that the

minimum distance from the Sun's center to the postulated center of the terminus of the vortex—actually, the geometrical origin of the three-dimensional figure which was the hyperplane of intersection—was three point two six four seven, approximately astronomical units; the last figure being tentative and somewhat uncertain because of the rapidly moving masses of Jupiter—

"Cover everything beyond three units out in every direction," Haynes directed, when he got that far along the tape. He had no time to listen to an hour of mathematical dissertation. What he wanted was *facts*.

Shortly thereafter, five-man speedsters, plentifully equipped with new instruments, flashed at full drive along courses carefully calculated to give the greatest possible coverage in the shortest possible time.

Unobtrusively the loose planets closed in upon the Solar System. Not close enough to affect appreciably the orbits of Sol's own children, but close enough so that at least three or four of them could reach any designated point in one minute or less. And the outlying units of Grand Fleet, too, were pulled in. That fleet was not actually mobilized—yet—but every vessel in it was kept in readiness for instant action.

"No trace," came the report from the Medonian surveyors, and Haynes looked at Kinnison, quizzically.

"QX, chief—glad of it," the Gray Lensman answered the unspoken query. "If it was up, that would mean that they were on the way. Hope they don't get a trace for two months yet. But I'm next to positive that that's the way they're coming and the longer they put it off the better—there's a possible new projector that will take a bit of dop-

ing out. I've got to do a flit—can I have the *Dauntless*?"

"Sure—anything you want. She's yours, anyway."

KINNISON went. And, wonder of wonders, he took Sir Austin Cardynge with him. From solar system to solar system, from planet to planet, the mighty *Dauntless* hurtled at the incomprehensible velocity of her full maximum blast; and every planet so visited was the home world of one of the most co-operative—or, more accurately, one of the least non-co-operative—members of the Conference of Scientists. For days brilliant but more or less unstable minds struggled with new and obdurate problems; struggled heatedly and with friction, as was their wont. Few, if any, of those mighty intellects would have really enjoyed a quietly studious session, even had such a thing been possible.

Then Kinnison returned his guests to their respective homes and shot his flying warship-laboratory back to Prime Base. And, even before the *Dauntless* landed, the first few hundreds of a fleet which was soon to be numbered in the millions of meteor miners' boats began working like beavers to build a new and exactly designed system of asteroid belts of iron meteors.

And soon, as such things go, new structures began to appear here and there in the void. Comparatively small, these things were; tiny, in fact, compared to the Patrol's maulers. Unarmed, too; carrying nothing except defensive screen. Each was, apparently, simply a powerhouse; stuffed skin full of atomic motors, exciters, intakes and generators of highly peculiar design and pattern. Unnoticed except by gauntly haggard Thorndyke and his experts, who kept dashing from one

of the strange craft to another, each took its place in a succession of precisely determined relationships to the Sun.

Between the orbits of Mars and of Jupiter, the new, sharply defined rings of asteroids moved smoothly. Grand Fleet formed an enormous hollow globe, six astronomical units in diameter. Outside that globe the surveying speedsters and flitters rushed madly hither and yon. Uselessly, apparently, for not one needle of the vortex detectors stirred from its zero pin.

And as nearly as possible at the center of that globe, circling the Sun well inside the orbit of Venus, there floated the flagship. Technically the *Z9M9Z*, socially the *Directrix*, ordinarily simply *GFHQ*, that ship had been built specifically to control the operations of a million separate flotillas. At her million-plug board stood—they had no need, ever, to sit—two hundred blocky, tentacle-armed Rigellians. They were waiting, stolidly motionless.

Intergalactic space remained empty. Interstellar ditto, ditto. The flitters flitted, fruitlessly.

But if everything out there in the threatened volume of space seemed quiet and serene, things in the *Z9M9Z* were distinctly otherwise. Haynes and Kinnison, upon whom the heaviest responsibilities rested, were tensely ill at ease.

The admiral had his formation made, but he did not like it at all. It was too big, too loose, too cumbersome. The Boskonian fleet might appear anywhere outside that thin globe of Patrol ships, and it would take him far, far too long to get any kind of a fighting formation made, anywhere. So he worried. Minutes dragged—he wished that the pirates would hurry up and start something!

Kinnison was even less easy in

his mind. He was not afraid of negaspheres, even if Boskonian should have them; but he was afraid of fortified, mobile planets. The super-maulers were big and powerful, of course, but they very definitely were not planets; and the big, new idea was mighty hard to jell. He did not like to bother Thorndyke by calling him—the master technician had troubles of his own—but the reports that were coming in were none too cheery. The excitation was wrong or the grid action was too unstable or the screen potentials were too high or two low or something. Sometimes they got a concentration, but it was just as apt as not to be a spread flood instead of a tight beam. To Kinnison, therefore, the minutes fled like seconds—but every minute that space remained clear was one more precious minute gained.

THEN, suddenly, it happened. A needle leaped into significant figures. Relays clicked, a bright red light flared into being, a gong clanged out its raucous warning. A fractional instant later ten thousand other gongs in ten thousand other ships came brazenly to life as the discovering speedster automatically sent out its number and position; and those other ships—surveyors all—flashed toward that position and dashed frantically about. Theirs the task to determine, in the least number of seconds possible, the approximate location of the center of emergence.

For Port Admiral Haynes, canny old tactician that he was, had planned his campaign long since. It was standing plain in his tactical tank—to inglobe the entire space of emergence of the foe and to blast them out of existence before they could maneuver. If he could get into formation before the Boskonians appeared, it would be a simple



slaughter—if not, it might be otherwise. Hence seconds counted; and hence he had had high-speed computers working steadily for weeks at the computation of courses for every possible center of emergence.

"Get me that center—fast!"

Haynes barked at the surveyors, already blasting at maximum.

It came in. The chief computer yelped a string of numbers. Selected loose-leaf binders were pulled down, yanked apart, and distributed on the double, leaf by leaf. And:

"Get it over there! Especially the shock globe!" the port admiral yelled.

For he himself could direct the engagement only in broad; details must be left to others. To be big enough to hold in any significant relationship the millions of lights representing vessels, fleets, planets, structures and objectives, the Operations tank of the *Directrix* had to be seven hundred feet in diameter; and it was a sheer physical impossibility for any ordinary mind either to perceive that seventeen million cubic feet of space as a whole or to make any sense at all out of the stupendously bewildering maze of multicolored lights crawling and flashing therein.

Kinnison and Worsel had handled Grand Fleet Operations during the Battle of Jarnevon, but they had discovered that they could have used some help. Four Rigellian Lensmen had been training for months for that all-important job, but they were not yet ready. Therefore the two old masters and one new one now labored at GFO: three tremendous minds, each supplying something that the others lacked. Kinnison of Tellus, with his hard, flat driving urge, his unconquerable, unstoppable will to do. Worsel of Velantia, with the prodigious reach and grasp

which had enabled him, even without the Lens, to scan mentally a solar system eleven light-years distant. Tregonsee of Rigel IV, with the vast, calm certainty, the imperturbable poise peculiar to his long-lived, solemn race. Unattached Lensmen all; minds linked, basically, together into one mind by a wide-open three-way, superficially free, each to do his assigned third of the gigantic task.

Smoothly, effortlessly, those three linked minds went to work at the admiral's signal. Orders shot out along tight beams of thought to the stolid hundreds of Rigellian switch-board operators, and thence along communicator beams to the pilot rooms, wherever stationed. Flotillas, squadrons, subfleets flashed smoothly toward their newly assigned positions. Supermaulers moved ponderously toward theirs. The survey ships, their work done, vanished. They had no business anywhere near what was coming next. Small they were, and defenseless; a speedster's screens were as efficacious as so much vacuum against the forces about to be unleashed. The powerhouses also moved. Maintaining rigidly their cryptic mathematical relationships to each other and the Sun, they went as a whole into a new one with respect to the circling rings of tightly packed meteors and the invisible, nonexistent mouth of the Boskonian vortex.

Then, before Haynes' formation was nearly complete, the Boskonian fleet materialized. Just that—one instant space was empty; the next it was full of warships. A vast globe of battle wagons, in perfect fighting formation. They were not free, but inert and deadly.

Haynes swore viciously under his breath, the Lensmen pulled themselves together more tensely; but no

additional orders were given. Everything that could possibly be done was already being done.

WHETHER the Boskonians expected to meet a perfectly placed fleet or whether they expected to emerge into empty space, to descend upon a defenseless Tellus, is not known or knowable. It is certain, however, that they emerged in the best possible formation to meet anything that could be brought to bear. It is also certain that, had the enemy had a Z9M9Z and a Kinnison-Worsel-Tregonsee combination scanning its Operations tank, the outcome might well have been otherwise than it was.

For that ordinarily insignificant delay, that few minutes of time necessary for the Boskonians' orientation, was exactly that required for these two hundred smoothly working Rigellians to get Civilization's shock globe into position.

A million beams, primaries raised to the hellish heights possible only to Medonian conductors and insulation, lashed out almost as one. Screens stiffened to the urge of every generable watt of defensive power. Bolt after bolt of quasisolid lightning struck and struck and struck again. Q-type helices bored, gouged and searingly hit. Rods and cones, planes and shears of incredibly condensed pure force clawed, tore and ground in mad abandon. Torpedo after torpedo, charged to the very skin with duodec, loosed its horribly detonant cargo against flinching wall shields, in such numbers and with such violence as to fill all circumambient space with an atmosphere of almost planetary density.

Screen after screen, wall shield after wall shield, in their hundreds and their thousands, went down. A

full eighth of the Patrol's entire count of battleships were wrecked, riddled, blown apart or blasted completely out of space in the paralyzingly cataclysmic violence of that first, seconds-long, mind-shaking, space-racking encounter. Nor could it have been otherwise; for this encounter had not been at battle range. Not even at point-blank range; the warring monsters of the void were packed practically screen to screen.

But not a man died—upon Civilization's side at least—even though practically all of the myriad of ships composing the inner sphere, the shock globe, was lost. For they were automatic; manned by robots; what little superintendence was necessary had been furnished by remote control. Indeed it is possible, although perhaps not entirely probable, that the shock globe of the foe was similarly manned.

That first frightful meeting gave time for the reserves of the Patrol to get there, and it was then that the superior Operations control of the *Z9M9Z* made itself tellingly felt. Ship for ship, beam for beam, screen for screen, the Boskonians were, perhaps, equal to the Patrol; but they did not have the perfection of control necessary for unified action. The field was too immense, the number of contending units too enormously vast. But the mind of each of the three Unattached Lensmen read aright the flashing lights of his particular volume of the gigantic tank and spread their meaning truly in the infinitely smaller space model beside which Admiral Haynes, master tactician, stood. Scanning the entire space of battle as a whole, he rapped out general orders—orders applying, perhaps, to a hundred or to five hundred planetary fleets. Kinnison and his fellows broke these orders down for the operators, who

in turn told the vice admirals and rear admirals of the fleets what to do. They gave detailed orders to the units of their commands, and the line officers, knowing exactly what to do and precisely how to do it, did it with neatness and dispatch.

There was no doubt, no uncertainty, no indecision or wavering. The line officers, even the rear and vice admirals, knew nothing, could know nothing whatever of the progress of the engagement as a whole. But they had worked under the *Z9M9Z* before. They knew that the maestro Haynes did know the battle as a whole. They knew that he was handling them as carefully and as skillfully as a master at chess plays his pieces upon the square-filled board. They knew that Kinnison or Worsel or Tregonsee was assigning no task too difficult of accomplishment. They knew that they could not be taken by surprise, attacked from some unexpected and unprotected direction; knew that, although in those hundreds of thousands of cubic miles of space there were hundreds of thousands of highly inimical and exceedingly powerful ships of war, none of them were, or shortly could be, in position to do them serious harm. If there had been, they would have been pulled out of there, *beaucoup* fast. They were as safe as anyone in a warship in such a war could expect, or even hope, to be. Therefore they acted instantly; directly, wholeheartedly and efficiently; and it was the Boskonians who were taken, repeatedly and by the thousands, by surprise.

For the enemy, as has been said, did not have the Patrol's smooth perfection of control. Thus several of Civilization's fleets, acting in full synchronizing, could and repeatedly did rush upon one unit of the

foe; inglobing it, blasting it out of existence, and dashing back to stations; all before the nearest-by fleets of Boskone knew even that a threat was being made. Thus ended the second phase of the battle, the engagement of the two Grand Fleets, with the few remaining thousands of Boskone's battleships taking refuge upon or near the phalanx of planets which had made up their center.

PLANETS. Seven of them. Armed and powered as only a planet can be armed and powered; with fixed-mount weapons impossible of mounting upon any lesser mobile base, with fixed-mount intakes and generators which only planetary resources could excite or feed. Galactic Civilization's war vessels fell back. Attacking a full-armed planet was no part of their job. And as they fell back, the supermaulers moved ponderously up and went to work. This was their dish; for this they had been designed. Tubes, lances, stilettos of unthinkable energies raved against their mighty screens; bouncing off, glancing away, dissipating themselves in space-torturing discharges as they hurled themselves upon the nearest ground. In and in the monsters bored, inexorably taking up their positions directly over the ultra-protected domes which, their commanders knew, sheltered the vitally important Bergenholms and controls. Then they loosed forces of their own. Forces of such appalling magnitude as to burn out in the twinkling of an eye projector shells of a refractoriness to withstand for ten full seconds the maximum output of a first-class battleship's primary batteries!

The resultant beam was of very short duration, but of utterly intolerable poignancy. No material substance could endure it even mo-

mentarily. It pierced instantly the hardest, tightest wall shield known to the scientists of the Patrol. It was the only known thing which could cut or rupture the ultimately stubborn fabric of a Q-type helix. Hence it is not to be wondered at that as those incredible needles of ravening energy stabbed and stabbed and stabbed again at Boskonian domes every man of the Patrol, even Kimball Kinnison, fully expected those domes to go down.

But those domes held. And those fixed-mount projectors hurled back against the supermaulers forces at the impact of which course after course of fierce-driven defensive screen flamed through the spectrum and went down.

"Back! Get them back!" Kinnison whispered, white-lipped, and the attacking structures sullenly, stubbornly gave way.

"Why?" gritted Haynes. "They're all we've got."

"You forget the new one, chief—give us a chance."

"What makes you think it'll work?" the old admiral flashed the searing thought. "It probably won't—and if it doesn't—"

"If it doesn't," the younger man shot back, "we're no worse off than now to use the maulers. But we've got to use the sunbeam *now* while those planets are together and before they start toward Tellus."

"QX," the admiral assented; and, as soon as the Patrol's maulers were out of the way:

"Verne?" Kinnison flashed a thought. "We can't crack 'em. Looks like it's up to you—what do you say?"

"Jury-rigged—don't know whether she'll light a cigarette or not—but here she comes!"

THE SUN, shining so brightly, darkened almost to the point of invisibility. The war vessels of the enemy disappeared, each puffing out into a tiny, but brilliant, sparkle of light.

Then, before the beam could affect the enormous masses of the planets, the engineers lost it. The sun flashed up—dulled—brightened—darkened—wavered. The beam waxed and waned irregularly; the planets began to move away under the urgings of their now thoroughly scared commanders.

Again, while millions upon millions of tensely straining Patrol officers stared into their plates, haggard Thorndyke and his sweating crews got the sunbeam under control again—and, in a heart-stoppingly wavering fashion, held it together. It flared—sputtered—ballooned out—but very shortly, before they could get out of its way, the planets began to glow. Ice caps melted, then boiled. Oceans boiled, their surfaces almost exploding into steam. Mountain ranges melted and flowed sluggishly down into valleys. The Boskonian domes of force went down and stayed down.

"QX, Kim—let be," Haynes ordered. "No use overdoing it. Not bad-looking planets; maybe we can use them for something."

The sun brightened to its wonted splendor, the planets began visibly to cool—even the Titanic forces then at work had heated those planetary masses only superficially.

The battle was over.

"What in all the purple hells of Palain did you do, Haynes, and how?" demanded the *Z9M9Z's* captain.

"He used the whole damned solar system as a vacuum tube!" Haynes explained, gleefully. "Those power stations out there, with all their mo-

tors and intake screens, are simply the power leads. The asteroid belts, and maybe some of the planets, are the grids and plates. The sun is—"

"Hold on, chief!" Kinnison broke in. "That isn't quite it. You see, the directive field set up by the—"

"Hold on yourself!" Haynes ordered, brusquely. "You're too damned scientific, just like Sawbones Lacy. What do Rex and I care about technical details that we can't understand, anyway? The net result is what counts—and that was to concentrate upon those planets practically the whole energy output of the Sun. Wasn't it?"

"Well, that's the main idea," Kinnison conceded. "The energy equivalent, roughly, of four million one hundred and fifty thousand tons per second of distintegrating matter."

"*Whew!*" the captain whistled. "No wonder it frizzled 'em up."

"I can say now, I think, with no fear of successful contradiction, that *Tellus* is strongly held," Haynes stated, with conviction. "What now, Kim, old son?"

"I think they're done, for a while," the Gray Lensman pondered. "Cardynge can't communicate through the tube, so probably they can't; but if they managed to slip an observer through, they may know how almighty close they came to licking us. On the other hand, Verne says that he can get the bugs out of the sunbeam in a couple of weeks—and when he does, the next zwilnik he cuts loose at is going to get a surprise."

"I'll say so," Haynes agreed. "We'll keep the surveyors on the prowl, and some of the Fleet will always be close by. Not all of it, of course—we'll adopt a schedule of reliefs—but enough of it to be useful. That ought to be enough, don't you think?"

"I think so—yes," Kinnison answered, thoughtfully. "I'm just about positive that they won't be in shape to start anything here again for a long time. And I had better get busy, sir, on my own job—I've got to put out a few jets."

"I suppose so," Haynes admitted.

For Tellus *was* strongly held, now—so strongly held that Kinnison felt free to begin again the search upon whose successful conclusion depended, perhaps, the outcome of the struggle between Boskonia and Galactic Civilization.

III.

WHEN the forces of the Galactic Patrol blasted Helmuth's Grand Base out of existence and hunted down and destroyed his secondary bases throughout this galaxy, Boskone's military grasp upon Civilization was definitely broken. Some minor bases may have escaped destruction, of course. Indeed, it is practically certain that some of them did so, for there are comparatively large volumes of our Island Universe which have not been mapped, even yet, by the planetographers of the Patrol. It is equally certain, however, that they were relatively few and of no real importance. For warships, being large, cannot be carried around or concealed in a vest pocket—a war fleet must of necessity be based upon a celestial object not smaller than a very large asteroid. Such a base, lying close enough to any one of Civilization's planets to be of any use, could not be hidden successfully from the detectors of the Patrol.

Reasoning from analogy, Kinnison quite justifiably concluded that the back of the drug syndicate had been broken in similar fashion when he had worked upward through

Bominger and Strongheart and Crowninshield and Jalte to the dread council of Boskone itself. He was, however, wrong.

For, unlike the battleship, thionite is a vest-pocket commodity. Unlike the space-fleet base, a drug baron's headquarters can be, and frequently is, small, compact and highly mobile. Also, the Galaxy is huge, the number of planets in it immense, the total count of drug addicts utterly incomprehensible. Therefore it had been found more efficient to arrange the drug hookup in multiple series-parallel, instead of in the straight on cascade sequence which Kinnison thought that he had followed up.

He thought so at first, that is, but he did not think so long. He had thought, and he had told Haynes, as well as Gerrond of Radelix, that the situation was entirely under control; that with the zwilnik headquarters blasted out of existence and with all of the regional heads and many of the planetary chiefs dead or under arrest, all that the Enforcement men would have to cope with would be the normal bootleg trickle. In that, too, he was wrong. Gerrond and the other lawmen of Narcotics had had a brief respite, it is true; but in a few days or weeks, upon almost as many planets as before, the illicit traffic was again in full swing.

After the Battle of Tellus, then, it did not take the Gray Lensman long to discover the above facts. Indeed, they were pressed upon him. He was, however, more relieved than disappointed at the tidings, for he knew that he would have material upon which to work. If his original opinion had been right, if all lines of communication with the now completely unknown ultimate authorities of the zwilniks had been destroyed,

his task would have been an almost hopeless one.

It would serve no good purpose here to go into details covering his early efforts, since they embodied, in principle, the same tactics as those which he had previously employed. He studied, he analyzed, he investigated. He snooped and he spied. He fought; upon occasion he killed. And in due course—and not too long a course—he cut into the sign of what he thought must be a key zwilnik. Not upon Bronseca or Radelix or Chickladoria, or any other distant planet, but right upon Tellus!

But he could not locate him. He never saw him upon Tellus. As a matter of cold fact, he could not find a single person who had ever seen him or who knew anything definite about him except a number. These facts, of course, only whetted Kinnison's keenness to come to grips with the fellow. He might not be a very big shot, but the fact that he was covering himself up so thoroughly and so successfully made it abundantly evident that he was a fish well worth landing.

This wight, however, proved to be as elusive as the proverbial flea. He was never there when Kinnison pounced. In London he was a few minutes late. In Berlin he was a minute or so too early—and the ape didn't show up at all. He missed him in Paris and in San Francisco and in Shanghai. The guy settled down finally in New York, but still the Gray Lensman could not connect—it was always the wrong street, or the wrong house, or the wrong time, or something.

THEN Kinnison set a snare which should have caught a microbe—and almost caught his zwilnik. He missed him by one mere second when he

blasted off from New York Spaceport. He was so close that he saw his flare, so close that he could slap onto the fleeing vessel the beam of the CRX tracer which he always carried with him.

Unfortunately, however, the Lensman was in mufti at the time, and was driving a rented flitter. His speedster—altogether too spectacular and obvious a conveyance to be using in a hush-hush investigation—was at Prime Base. He didn't want the speedster, anyway, except inside the *Dauntless*. He'd go organized this time to chase the lug clear out of space, if he had to. He shot in a call for the big cruiser, and while it was coming he made luridly sulphurous inquiry.

Fruitless. His orders had been carried out to the letter, except in the one detail of not allowing any vessel to take off. This take-off absolutely could not be helped—it was just one of those things. The ship was a Patrol speedster from Deneb V, registry number so-and-so. Said he was coming in for servicing. Came in on the north beam, identified himself properly—Lieutenant Quirkenfal, of Deneb V, he said he was, and it checked—

It would check, of course. The zwilnik that Kinnison had been chasing so long certainly would not be guilty of any such raw, crude work as a faulty identification. In fact, right then he probably looked just as much like Quirkenfal as the lieutenant himself did.

"He wasn't in any hurry at all," the informant went on. "He waited around for his landing clearance, then slanted in on his assigned slide to the service pits. In the last hundred yards, though, he shot off to one side and sat down, *plop*, broadside on, clear over there in the far corner of the field. But he wasn't

down but a second, sir. Long before anybody could get to him—before the cruisers could put a beam on him, even—he blasted off as though the devil were on his tail. Then you came along, sir, but we did put a CRX tracer on him—”

“I did that much, myself,” Kennison stated, morosely. “He stopped just long enough to pick up a passenger—my zwilnik, of course—then flitted—and you fellows let him get away with it.”

“But we couldn’t help it, sir,” the official protested. “And, anyway, he couldn’t possibly have—”

“He sure could. You’d be surprised no end at what that ape can do.”

Then the *Dauntless* flashed in; not asking but demanding instant right of way.

“Look around, fellows, if you like, but you won’t find a damned thing,” Kinnison’s uncheering conclusion came back as he sprinted toward the dock into which his battleship had settled. “The lug hasn’t left a loose end dangling yet.”

By the time the great Patrol ship had cleared the stratosphere, Kinnison’s CRX, powerful and tenacious as it was, was just barely registering a line. But that was enough. Henry Henderson, master pilot, stuck the *Dauntless’* needle nose into that line and shoved into the driving projectors every watt of “oof” that those Brobdignagian creations would take.

THEY had been following the zwilnik for three days now, Kinnison reflected, and his CRX’s were none too strong yet. They were overhauling him mighty slowly; and the *Dauntless* was supposed to be the fastest thing in space. That can up ahead had plenty of legs—must have been souped up to the limit. This

was apt to be a long chase, but he’d get that bozo if he had to chase him on a geodesic line along the hyper-dimensional curvature of space clear back to Tellus where he started from!

They did not have to circumnavigate total space, of course, but they did almost leave the Galaxy before they could get the fugitive upon their plates. The stars were thinning out fast; but still, hazily before them in a vastness of distance, there stretched a milky band of opalescence.

“What’s coming up, Hen—a rift?” Kinnison asked.

“Uh-huh, Rift 94,” the pilot replied. “And if I remember right, that arm up ahead is Dunstan’s Region and it has never been explored. I’ll have the chart room check up on it.”

“Never mind! I’ll go check it myself—I’m curious about this whole thing.”

Unlike any smaller vessel, the *Dauntless* was large enough so that she could—and hence as a matter of course did—carry every space chart issued by all the various Boards and Offices and Bureaus concerned with space, astronomy, astrogation and planetography. She had to, for there were usually minds aboard which were apt at any time to become intensely and unpredictably interested in anything, anywhere. Hence it did not take Kinnison long to obtain what little information there was.

The vacancy they were approaching was Rift 94, a vast space, practically empty of stars, lying between the main body of the Galaxy and a minor branch of one of its prodigious spiral arms. The opalescence ahead was the branch—Dunstan’s Region. Henderson was right; it had never been explored.

The Galactic Survey, which has

not even yet mapped the whole of the Galaxy proper, had of course done no systematic work upon such outlying sections as the spiral arms. Some such regions were well known and well mapped, it is true; either because its own population, independently developing means of space flight, had come into contact with our Civilization upon its own initiative or because private exploration and investigation had opened up profitable lines of commerce. But Dunstan's Region was bare. No people resident in it had ever made themselves known; no private prospecting, if there had ever been any such, had revealed anything worthy of exploitation or development. And, with so many perfectly good uninhabited planets so much nearer to Galactic Center, it was, of course, much too far out for colonization.

Through the rift, then, and into Dunstan's Region the *Dauntless* bored at the unimaginable pace of her terrific full-blast drive. The tracers' beams grew harder and more taut with every passing hour; the fleeing speedster itself grew large and clear upon the plates. The opalescence of the spiral arm became a firmament of stars. A sun detached itself from that firmament; a dwarf of Type G—and planets.

One of these in particular, the second out, looked so much like Earth that it made some of the observers homesick. There were the familiar polar ice caps, the atmosphere and stratosphere, the high-piled, billowy masses of clouds. There were vast blue oceans, there were huge, unfamiliar continents glowing with chlorophyllic green.

AT THE spectroscopes, at the bolometers, at the many other instruments men went rapidly and skillfully to work.

"Hope the ape's heading for Two, and I think he is," Kinnison remarked, as he studied the results. "People living on that planet would be human to ten places, for all the tea in China. No wonder he was so much at home on Tellus—Yup, it's Two—there, he's gone inert."

"Whoever is piloting that can went to school just one day in his life and that day it rained and the teacher didn't come," Henderson snorted. "And he's trying to balance her down on her tail—look at her bounce and flop around! He's just begging for a crack-up."

"If he makes it, it'll be bad—plenty bad," Kinnison mused. "He'll gain a lot of time on us while we're rounding the globe on our landing spiral."

"Why spiral, Kim? Why not follow him down, huh? Our intrinsic is no worse than his—it's the same one, in fact."

"Get conscious, Hen. You haven't got a speedster under you now."

"So what? I can certainly handle this scrap heap a damn sight better than that ground-gripper is handling that speedster." Henry Henderson, Master Pilot No. 1 of the Service, was not bragging. He was merely voicing what to him was the simple and obvious truth.

"Mass is what. Mass and volume and velocity and inertia and power. You never stunted this much weight before, did you?"

"No; but what of it? I took a course in piloting once, in my youth." He was then a grand old man of twenty-eight or thereabouts. "I can line up the main rear center pipe onto any grain of sand you want to pick out on that field, and hold her there until she slags it down."

"If you think you can spell 'able,' hop to it!"



"QX, this is going to be fun." Henderson gleefully accepted the challenge, then clicked on his general alarm microphone. "Strap down, everybody, for inert maneuvering. Class 9. Four G's on the tail. Tail over to belly landing. Hipe!"

The Bergenholms were cut and as the tremendously massive super-dreadnought, inert, shot off at an angle under its Tellurian intrinsic velocity, Master Pilot No. 1 proved his rating. As much a virtuoso of the banks and tiers of blast keys and levers before him as a concert organist is of his instrument, his hands and feet flashed hither and yon. Not music?—the bellowing, crescendo thunders of those jets *were* music to the hard-boiled spacehounds who heard them. And in response to the exact placement and the precisely measured power of those blasts the

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great sky rover spun, twisted and bucked as her prodigious mass was forced into motionlessness relative to the terrain beneath her.

Four G's, Kinnison reflected, while this was going on. Not bad—he had thought that it would take five; possibly six. He could sit up and take notice at four, and he did so.

THIS WORLD wasn't very densely populated, apparently. Quite a few cities, but all just about on the equator. Nothing in the temperate zones at all; even the highest power revealed no handiwork of man. Virgin forest, untouched prairie. Lots of roads and things in the torrid zone, but nothing anywhere else. The speedster was making a rough and unskillful, but not catastrophic landing.

The field which was their destina-

tion lay just outside a large city. Funny—it wasn't a spacefield at all. No docks, no pits, no ships. Low, flat buildings—hangars. An airfield, then, although not like any airfield upon Tellus. Too small. Gyros? 'Copters? Didn't see any—all little ships. Crates—biplanes and tripes. Made of wire and fabric. Wotta woi!, wotta woi!

The *Dauntless* landed, fairly close to the now deserted speedster.

"Hold everything, men," Kinnison cautioned. "Something funny here. I'll do a bit of looking around before we open up."

He was not surprised that the people in and around the airport were human to at least ten places of classification; he had expected that from the planetary data. Nor was he surprised at the fact that they wore no clothing. He had learned long since that, while human or near-human races—particularly the women—wore at least a few ornaments, the wearing of clothing as such, except when it was actually needed for protection, was far more the exception than the rule. And, just as a Martian, out of deference to conventions, wears a light robe upon Tellus, Kinnison as a matter of course stripped to his evenly tanned hide when visiting planets upon which nakedness was *de rigueur*. He had attended more than one State function, without a quibble or a qualm, tastefully attired in a pair of sandals and his DeLameters.

No, the startling fact was that there was not a man in sight anywhere around the place; there was nothing male perceptible as far as his sense of perception could reach. Women were laboring, women were supervising, women were running the machines. Women were operating the airplanes and servicing them. Women were in the offices. Women

and girls and little girls and girl babies filled the waiting rooms and the automobilelike conveyances parked near the airport and running along the streets.

And, even before Kinnison had finished uttering his warning, while his hand was in the air reaching for a spy ray switch, he felt an alien force attempting to insinuate itself into his mind.

Fat chance! With any ordinary mind it would have succeeded, but in the case of the Gray Lensman it was just like trying to stick a pin unobtrusively into a panther. He put up a solid block automatically, instantaneously; then, a fraction of a second later, a thought-tight screen enveloped the whole vessel.

"Did any of you fellows—" he began, then broke off. They wouldn't have felt it, of course; their brains could have been read completely with them none the wiser. He was the only Lensman aboard, and even most Lensmen couldn't—this was *his* oyster. But that kind of stuff, on such an apparently backward planet as this? It didn't make sense, unless that *zwilnik*— Ah, this *was* his oyster, absolutely!

"Something funnier even than I thought—thought-waves," he calmly continued his original remark. "Thought I'd better undress to go out there, but I'm not going to. I'd wear full armor, except that I may need my hands or have to move fast. If they get insulted at my clothes, I'll apologize later."

"But, listen, Kim, you can't go out there alone—especially without armor!"

"Sure I can. I'm not taking any chances. You fellows couldn't do me much good out there, but you can here. Break out the 'copter and keep a spy ray on me. If I give you the signal, go to work with a couple

of narrow needle beams. Pretty sure that I won't need any help, but you can't always tell."

THE AIR LOCK opened and Kinnison stepped out. He had a high-powered thought-screen, but he did not need it—yet. He had his De-Lameters. He had also a weapon deadlier by far even than those mighty portables; a weapon so utterly deadly that he had not used it. He did not need to test it—since Worsel had said that it would work, it would. The trouble with it was that it could not merely disable; if used at all it killed, with complete and grim finality. And behind him he had the full awful power of the *Dauntless*. He had nothing to worry about.

Only when the spaceship had settled down upon and into the hard-packed soil of the airport could those at work there realize just how big and how heavy the visitor was. Practically everyone stopped work and stared, and they continued to stare as Kinnison strode toward the office. The Lensman had landed upon many strange planets, he had been met in divers fashions and with various emotions; but never before had his presence stirred up anything even remotely resembling the sentiments written so plainly upon these women's faces and expressed even more plainly in their seething thoughts.

Loathing, hatred, detestation—not precisely any one of the three, yet containing something of each. As though he were a monstrosity, a revolting abnormality that should be destroyed on sight. Beings such as the fantastically ugly, spiderlike denizens of Dekanore VI had shuddered at the sight of him, but their thoughts were mild compared to these. Besides, that was natural

enough. Any human being would appear a monstrosity to such as those. But these women were human; as human as he was. He didn't get it, at all.

Kennison opened the door and faced the manager, who was standing at that other-worldly equivalent of a desk. His first glance at her brought to the surface of his mind one of the peculiarities which he had already unconsciously observed. Here, for the first time in his life, he saw a woman without any touch whatever of personal adornment. She was tall and beautifully proportioned, strong and fine; her smooth skin was tanned to a rich and even brown. She was clean, almost blatantly so.

But she wore no jewelry, no bracelets, no ribbons; no decorations of any sort or kind. No paint, no powder, no touch of perfume. Her heavy, bushy eyebrows had never been either plucked or clipped. Some of her teeth had been expertly filled, and she had a two-tooth bridge that would have done credit to any Tellurian dentist—but her hair! It, too, was painfully clean, as was the white scalp beneath it, but aesthetically it was a mess. Some of it reached almost to her shoulders, but it was very evident that whenever a lock grew long enough to be a bother she was wont to grab it and hew it off, as close to the skull as possible, with whatever knife, shears or other implement came readiest to hand.

These thoughts and the general inspection did not take any appreciable length of time, of course. Before Kinnison had taken two steps toward the manager's desk, he directed a thought:

"Kinnison of Sol III—Lensman, Unattached. It is possible, however, that neither Tellus nor the

Lens are known upon this planet?"

"Neither is known, nor do we care to know them," she replied, coldly. Her brain was keen and clear; her personality vigorous, striking, forceful. But, compared with Kinnison's doubly Arisian-trained mind, hers was woefully slow. He watched her assemble the mental bolt which was intended to slay him then and there. He let her send it, then struck back. Not lethally, not even paralyzingly, but solidly enough so that she slumped down, almost unconscious, into a nearby chair.

"It's good technique to size a man up before you tackle him, sister," he advised her when she had recovered. "Couldn't you tell from the feel of my mind-block that *you* couldn't crack it?"

"I was afraid so," she admitted, hopelessly, "but I had to kill you if I possibly could. Since you are the stronger you will, of course, kill me." Whatever else these peculiar women were, they were stark realists. "Go ahead—get it over with. But it *can't* be!" Her thought was a wail of protest. "I do not grasp your thought of 'a man,' but you are certainly a male; and no mere *male* can be—can *possibly* be, ever—as strong as a person."

KINNISON got that thought perfectly, and it rocked him. She did not think of herself as a woman, a female, at all. She was simply a *person*. She could not understand even dimly Kinnison's reference to himself as a man. To her, "man" and "male" were synonymous terms. Both meant sex, and nothing whatever except sex.

"I have no intention of killing you, or anyone else upon this planet," he informed her levelly, "unless I absolutely have to. But I have chased that speedster over there all

the way from Tellus, and I intend to get the man that drove it here, if I have to wipe out half of your population to do it. Is that perfectly clear?"

"That is perfectly clear, male." Her mind was fuzzy with a melange of immiscible emotions. Surprise and relief that she was not to be slain out of hand; disgust and repugnance at the very idea of such a horrible, monstrous male creature having the audacity to exist; stunned, disbelieving wonder at his unprecedented power of mind; a dawning comprehension that there were perhaps some things which she did not know: these and numerous other conflicting thoughts surged through her mind. "But there was no male within the space-traversing vessel which you think of as a 'speedster,'" she concluded, surprisingly.

And he knew that she was not lying. No mentality in existence, not even that of Mentor the Arisian, could lie to Gray Lensman Kinnison against his will.

"Damnation!" he snorted to himself. "Fighting against *women* again!"

"Who was she, then—it, I mean?" he hastily corrected the thought.

"It was our elder sister—"

The thought so translated by the man was not really "sister." That term, having distinctly sexual connotations and implications, would never have entered the mind of any "person" of Lyrane II. "Elder child of the same heritage" was more like it.

"—and another person from what it claimed was another world," the thought flowed smoothly on. "An entity, rather, not really a person, but you would not be interested in that, of course."

"Of course I would," Kinnison assured her. "In fact, it is this other

person, and not your elderly relative, in whom I am interested. But you say that it is an entity, not a person. How come? Tell me all about it."

"Well, it looked like a person, but it wasn't. Its intelligence was low, its brain power was small. And its mind was upon things . . . its thoughts were so—"

Kinnison grinned at the Lyranian's efforts to express clearly thoughts so utterly foreign to her mind as to be totally incomprehensible.

"You don't know what that entity was, but I do," he broke in upon her floundering. "It was a person who was also, and quite definitely, a female. Right?"

"But a person couldn't—couldn't possibly—be a female!" she protested. "Why, even biologically, it doesn't make sense. There are no such things as females—there *can't* be!" And Kinnison saw her viewpoint clearly enough. According to her sociology and conditioning there could not be.

"We'll go into that later," he told her. "What I want now is this female zwilnik. Is she—or it—with your elder relative now?"

"Yes. They will be having dinner in the hall very shortly."

"Sorry to be a bother, but you'll have to take me to them—right now."

"Oh, may I? Since I could not kill you myself, I must take you to them so that they can do it. I have been wondering how I could force you to go there," she explained, naively.

"Henderson?" The Lensman spoke into his microphone—thought-screens, of course, being no barrier to radio waves. "I'm going after the zwilnik. This woman here is taking me. Have the 'copter stay over me, ready to needle anything I tell them to. While I'm gone go over that

speedster with a fine tooth comb, and when you get everything we want, blast it. It and the *Dauntless* are the only space cans on the planet, and I haven't got a picture of them taking the cruiser away from you. But keep your thought-screens up. Don't let them down for a fraction of a second, because these janes here carry plenty of jets and they're just as sweet and reasonable as a cageful of cateagles. Got it?"

"On the tape, chief," came instant answer. "But don't take any chances, Kim. Sure you can swing it alone?"

"Jets enough and to spare," Kinnison assured him, curtly. Then, as the Tellurians' helicopter shot into the air, he again turned his thought to the manager.

"Let's go," he directed, and she led him across the way to a row of parked ground cars. She manipulated a couple of levers and smoothly, if slowly, the little vehicle rolled away.

THE DISTANCE was long and the pace was slow. The woman was driving automatically, the while her every sense was concentrated upon finding some weak point, some chink in his barrier, through which to thrust at him. Kinnison was amazed—stumped—at her fixity of purpose: at her grimly single-minded determination to make an end of him. She was out to get him, and she was not fooling.

"Listen, sister," he thought at her, after a few minutes of it; almost plaintively, for him. "Let's be reasonable about this thing. I told you that I didn't want to kill you; why in all the iridescent hells of space are you so dead set on killing me? If you don't behave yourself, I'll give you a treatment that will make your

head ache for the next six months. Why don't you snap out of it, you dumb little lug, and be friends?"

This thought jarred her so that she stopped the car, the better to stare directly and viciously into his eyes.

"Be friends? With a male?" The thought literally seared its way into the man's brain.

"Listen, half-wit!" Kinnison stormed, exasperated. "Forget your narrow-minded, one-planet prejudices and think for a minute, if you can think—use that pint of bean soup inside your skull for something besides hating me all over the place. Get this—I am no more a male than you are the kind of a female that you think, by analogy, such a creature would have to be if she could exist in a sane and logical world."

"Oh." The Lyranian was taken aback at such cavalier instruction. "But the others, those in your so-immense vessel, they are of a certainty males," she stated with conviction. "I understood what you told them via your telephone-without-conductors. You have mechanical shields against the thought which kills. Yet you do not have to use it, while the others—males indubitably—do. You yourself are not entirely a male; your brain is almost as good as a person's."

"Better, you mean," he corrected her. "You're wrong. All of us of the ship are men—all alike. But a man on a job can't concentrate all the time on defending his brain against attack, hence the use of thought-screens. I can't use a screen out here, because I've got to talk to you people. See?"

"You fear us, then, so little?" she flared, all of her old animosity blazing out anew. "You consider our power, then, so small a thing?"

"Right. Right to a hair," he de-

clared, with tightening jaw. But he did not believe it—quite. This girl was just about as safe to play around with as five-feet-eleven of coiled bushmaster, and twice as deadly.

She could not kill him mentally. Nor could the elder sister—whoever she might be—and her crew; he was pretty sure of that. But if they couldn't do him in by dint of brain it was a foregone conclusion that they would try brawn. And brawn they certainly had. This jade beside him weighed a hundred sixty-five or seventy, and she was trained down fine. Hard, limber and fast. He might be able to lick three or four of them—maybe half a dozen—in a rough-and-tumble brawl; but more than that would mean either killing or being killed. Damn it all! He'd never killed a woman yet, but it looked as though he might have to start in pretty quick now.

"WELL, let's get going again," he suggested, "and while we're en route let's see if we can't work out some basis of co-operation—a sort of live-and-let-live arrangement. Since you understood the orders I gave the crew, you realize that our ship carries weapons capable of razing this entire city in a space of minutes." It was a statement, not a question.

"I realize that." The thought was muffled in helpless fury. "Weapons, weapons—always *weapons!* The eternal *male!* If it were not for your huge vessel and the peculiar airplane hovering over us, I would claw your eyes out and strangle you with my bare hands!"

"That would be a good trick if you could do it," he countered, equably enough. "But listen, you frustrated young murderess. You have already shown yourself to be, basically, a realist in facing physical

facts. Why not face mental, intellectual facts in the same spirit?"

"Why, I do, of course. I *always* do!"

"You do not," he contradicted, sharply. "Males, according to your lights, have two—and only two—attributes. One, they breed. Two, they fight. They fight each other, and everything else, to the death and at the drop of a hat. Right?"

"Right, but—"

"But nothing—let me talk. Why didn't you breed the combativeness out of your males, hundreds of generations ago?"

"They tried it once, but the race began to deteriorate," she admitted.

"Exactly. Your whole set-up is cockeyed—unbalanced. You can think of me only as a male—one to be destroyed on sight, since I am not like one of yours. Yet, when I could kill you and had every reason to do so, I didn't. We can destroy you all, but we won't unless we must. What's the answer?"

"I don't know," she confessed, frankly. Her frenzied desire for killing abated, although her ingrained antipathy and revulsion did not. "In some ways, you do seem to have some of the instincts and qualities of a . . . almost of a person."

"I am a person—"

"You are *not*! Do you think that I am to be misled by the silly coverings you wear?"

"Just a minute. I am a person of a race having two *equal* sexes. Equal in every way. Numbers, too—one man and one woman—" and he went on to explain to her, as well as he could, the sociology of Civilization.

"Incredible!" she gasped the thought.

"But true," he assured her. "And now are you going to lay off me and behave yourself, like a good little girl, or am I going to have to do a

bit of massaging on your brain? Or wind that beautiful body of yours a couple of times around a tree? I'm asking this for your own good, kid, believe me."

"Yes, I do believe you," she marvelled. "I am becoming convinced that . . . that perhaps you *are* a person—at least of a sort—after all."

"Sure I am—that's what I've been trying to tell you for an hour. And cancel that 'of a sort,' too—"

"But tell me," she interrupted, "a thought you used—'beautiful.' I do not understand it. What does it mean, 'beautiful body'?"

"Holy Klono's whiskers!" If Kin-nison had never been stumped before, he was now. How could he explain beauty, or music, or art, to this . . . this matriarchal savage? How explain cerise to a man born blind? And, above all, who had ever heard of having to explain to a woman—to any woman, anywhere in the whole macrocosmic universe—that she in particular was beautiful?

But he tried. In her mind he spread a portrait of her as he had seen her first. He pointed out to her the graceful curves and lovely contours, the lithely flowing lines, the perfection of proportion and modeling and symmetry, the flawlessly smooth, firm-textured skin, the supple, hard-trained fineness of her whole physique. No soap. She tried, in brow-furrowing concentration, to get it, but in vain. It simply did not register.

"But that is merely efficiency, everything you have shown," she declared. "Nothing else. I must be so, for my own good and for the good of those to come. But I think that I have seen some of your beauty," and in turn she sent into his mind a weirdly distorted picture of a human woman. The zwilnik he

was following, Kinnison decided instantly.

She would be jeweled, of course, but not that heavily—a horse couldn't carry that load. And no woman ever born put paint on that thick, or reeked so of violent perfume, or plucked her eyebrows to such a thread, or indulged in such a hairdo.

"If *that* is beauty, I want none of it," the Lyranean declared.

Kinnison tried again. He showed her a waterfall, this time, in a stupendous gorge, with appropriate cloud formations and scenery. That, the girl declared, was simply erosion. Geological formations and meteorological phenomena. Beauty still did not appear. Painting, it appeared to her, was a waste of pigment and oil. Useless and inefficient—for any purpose of record the camera was much more precise and truthful. Music—vibrations in the atmosphere—would of necessity be simply a noise; and noise—any kind of noise—was not efficient.

"You poor little devil." The Lensman gave up. "You poor, ignorant, soul-starved little devil. And the worst of it is that you don't even realize—and never can realize—what you are missing."

"Don't be silly." For the first time, the woman actually laughed. "You are utterly foolish to make such a fuss about such trivial things."

KINNISON quit, appalled. He knew, now, that he and this apparently human creature beside him were as far apart as the Galactic Poles in every essential phase of life. He had heard of matriarchies, but he had never considered what a real matriarchy, carried to its logical conclusion, would be like.

This was it. For ages there had

been, to all intents and purposes, only one sex; the masculine element never having been allowed to rise above the fundamental necessity of reproducing the completely dominant female. And that dominant female had become, in every respect save the purely and necessitously physical one, absolutely and utterly sexless. Men, upon Lyrane II, were dwarfs about thirty inches tall. They had the temper and the disposition of a mad Radeligian cateagle, the intellectual capacity of a Zabriskian fontema. They were not regarded as people, either at birth or at any subsequent time. To maintain a static population, each person gave birth to one person, on the grand average. The occasional male baby—about one in a hundred—did not count. He was not even kept at home, but was taken immediately to the "maletorium," in which he lived until attaining maturity.

One man to a hundred or so women for a year, then death. The hundred persons had their babies at twenty-one or twenty-two years of age—they lived to an average age of a hundred years—then calmly blasted their male's mind and disposed of his carcass. The male was not exactly an outcast; not precisely a pariah. He was tolerated as a necessary adjunct to the society of persons, but in no sense whatever was he a member of it.

The more Kinnison pondered this hookup the more appalled he became. Physically, these people were practically indistinguishable from human, Tellurian, Caucasian women. But mentally, intellectually, in every other way, how utterly different! Shockingly, astoundingly so to any really human being, whose entire outlook and existence is fundamentally, however unconsciously or subconsciously, based upon and condi-

tioned by the prime division of life into two fully co-operant sexes. It didn't seem, at first glance, that such a cause could have such terrific effects; but here they were. In cold reality, these women were no more human than were the . . . the Eich. Take the Posenians, or the Rigellians, or even the Velantians. Any normal, stay-at-home Tellurian woman would pass out cold if she happened to stumble onto Worsel in a dark alley at night. Yet the members of his repulsively reptilian-appearing race, merely because of having a heredity of equality and co-operation between the sexes, were in essence more nearly human than were these tall, splendidly built, actually and intrinsically beautiful creatures of Lyrane II!

"This is the hall," the person informed him, as the car came to a halt in front of a large structure of plain gray stone. "Come with me."

"Gladly," and they walked across the peculiarly bare grounds. They were side by side, but a couple of feet apart. She had been altogether too close to him in the little car. She did not want this male—or *any* male—to touch her or to be near her. And, considerably to her surprise, if the truth were to be known, the feeling was entirely mutual. Kinnison would have preferred to touch a Borovan slime-lizard.

They mounted the granite steps. They passed through the dull, weather-beaten portal. They were still side by side—but they were now a full yard apart.

IV.

"LISTEN, my beautiful but dumb guide," Kinnison counseled the Lyranian girl as they neared their objective. "I see that you're forgetting all your good girl scout reso-

lutions and are getting all hot and bothered again. I'm telling you now for the last time to watch your step. If that zwilnik person has even a split second's warning that I am on her tail, all hell will be out for noon—and I don't mean perchance."

"But I must notify the Elder One that I am bringing you in," she told him. "One simply does not intrude unannounced. It is not permitted."

"QX. Stick to the announcement, though, and don't put out any funny ideas. I'll send a thought along, just to make sure."

But he did more than that, for even as he spoke, his sense of perception was already in the room to which they were going. It was a large room, and bare; filled with tables except for a clear central space upon which at the moment a lithe and supple person was doing what seemed to be a routine of acrobatic dancing, interspersed with suddenly motionless posings and posturings of extreme technical difficulty. At the tables were seated a hundred or so Lyranians, eating.

Kinnison was not interested in the floor show, whatever it was, nor in the massed Lyranians. The zwilnik was what he was after. Ah, there she was, at a ringside table—a small, square table seating four—near the door. Her back was to it—good. At her left, commanding the central view of the floor, was a redhead, sitting in a revolving, reclining chair, the only such seat in the room. Probably the Big Noise herself—the Elder One. No matter, he wasn't interested in her, either—yet. His attention flashed back to his proposed quarry and he almost gasped.

For she, like Dessá Desplaines, was an Aldebaranian, and she was everything that the Desplaines woman had been—more so, if possible. She was a seven-sector call-out,

a thionite dream if there ever was one. And jewelry! This Lyranian tiger hadn't exaggerated that angle very much, at that. Her breast shields were of gold and platinum filigree, thickly studded with diamonds, emeralds and rubies, in intricate designs. Her shorts, or rather trunks, were of Manarkan glamorette, blazing with gems. A cleverly concealed dagger, with a jeweled haft and a vicious little fang of a blade. Rings, even a thumb ring. A necklace which was practically a collar flashed all the colors of the rainbow. Bracelets, armlets, anklets and knee bands. High-laced dress boots, jeweled from stem to gudgeon. Earrings, and a meticulous, micrometrically precise coiffure held in place by at least a dozen glittering buckles, combs and barrettes.

"Holy Klono's brazen tendons!" the Lensman whistled to himself, for every last, least one of those stones was the clear quill. "Half a million credits if it's a millo's worth!"

But he was not particularly interested in this jeweler's vision of what the well-dressed lady zwilnik will wear. There were other, far more important things. Yes, she had a thought-screen. Its battery was mighty low now, but it would still work; good thing he had blocked the warning. And she had a hollow tooth, too, but he'd see to it that she didn't get a chance to swallow its contents. She knew plenty, and he hadn't chased her this far to let her knowledge be obliterated by that hellish Boskonian drug.

THEY WERE at the door now. Disregarding the fiercely driven mental protests of his companion, Kinnison flung it open, stiffening up his mental guard as he did so. Simultaneously he invaded the zwilnik's mind

with a flood of force, clamping down so hard that she could not move a single voluntary muscle. Then, paying no attention whatever to the shocked surprise of the assembled Lyranians, he strode directly up to the Aldebaranian and bent her head back into the crook of his elbow. Forcibly but gently he opened her mouth. With thumb and forefinger he deftly removed the false tooth. Releasing her then, mentally and physically, he dropped his spoil to the cement floor and ground it savagely to bits under his hard and heavy heel.

The zwilnik screamed wildly, piercingly at first. However, finding that she was getting no results, from Lensman or Lyranian, she subsided quickly into alertly watchful waiting.

Still unsatisfied, Kinnison flipped out one of his DeLameters and flamed the remains of the capsule of worse than paralyzing fluid, caring not a whit that his vicious portable, even in that brief instant, seared a hole a foot deep into the floor. Then and only then did he turn his attention to the redhead in the boss' chair.

He had to hand it to Elder Sister—through all this sudden and to her entirely unprecedented violence of action she hadn't turned a hair. She had swung her chair around so that she was facing him. Her back was to the athletic dancer who, now holding a flawlessly perfect pose, was going on with the act as though nothing out of the ordinary were transpiring. She was leaning backward, far backward, in the armless swivel chair, her right foot resting upon its pedestal. Her left ankle was crossed over her right knee, her left knee rested lightly against the table's top. Her hands were clasped together at the nape of her neck, supporting her red-thatched head;

her elbows spread abroad in easy, indolent grace. Her eyes, so deeply, darkly green as to be almost black, stared up unwinkingly into the Lensman's—"insolently" was the descriptive word that came first to his mind.

If the Elder Sister was supposed to be old, Kinnison reflected as he studied appreciatively the startlingly beautiful picture which the artless chief person of this tribe so unconsciously made, she certainly belied her looks. As far as looks went, she really qualified—whatever it took, she in abundant measure had. Her hair was not really red, either. It was a flamboyant, gorgeous auburn, about the same color as Chris' own, and just as thick. And it wasn't all haggled up. Accidentally, of course, and no doubt because on her particular job her hair didn't get in the way very often, it happened to be a fairly even, shoulder-length bob. What a mop! And damned if it wasn't wavy! Just as she was, with no dolling up at all, she would be a primary beam on any man's planet. She had this zwilnik here, knockout that she was and with all her war paint and feathers, blasted clear out of the ether. But this queen bee had a sting; she was still boring away at his shield. He'd better let her know that she didn't even begin to have enough jets to swing *that* load.

"QX, ace, cut the gun!" he directed crisply. "Ace," from him, was a complimentary term indeed. "Pipe down—that is all of that kind of stuff from you. I stood for this much of it, just to show you that you can't get to the first check station with that kind of fuel, but enough is a great plenty." At the sheer cutting power of the thought, rebroadcast no doubt by the airport

manager, Lyranian activity throughout the room came to a halt. This was decidedly out of the ordinary. For a male mind—*any* male mind—to be able even momentarily to resist that of the meanest person of Lyrane was starkly unthinkable. The Elder's graceful body tensed; into her eyes there crept a dawning doubt, a peculiar, wondering uncertainty. Of fear there was none; all these sexless Lyranian women were brave to the point of foolhardiness.

"You tell her, draggle-pate," he ordered his erstwhile guide. "It took me hell's own time to make you understand that I mean business, but you talk her language—see how fast you can get the thing through Her Royal Nibs' skull."

It did not take long. The lovely dark-green eyes held conviction now; but also a greater uncertainty.

"It will be best, I think, to kill you now, instead of allowing you to leave—" she began.

"Allow me to leave!" Kinnison exploded. "Where do you get such funny ideas as that killing stuff? Just who, Toots, is going to keep me from leaving?"

"This." At the thought a weirdly conglomerate monstrosity which certainly had not been in the dining hall an instant before leaped at Kinnison's throat. It was a frightful thing indeed, combining the worst features of the reptile and the feline, a serpent's head upon a panther's body. Through the air it hurtled, terrible claws unsheathed to rend and venomous fangs outthrust to stab.

Kinnison had never before met that particular form of attack, but he knew instantly what it was—knew that neither leather nor armor of proof nor screen of force could stop it. He knew that the thing was real only to the woman and himself,

that it was not only invisible, but nonexistent to everyone else. He also knew how ultimately deadly the creature was, knew that if claw or fang should strike him, he would die then and there.

Ordinarily very efficient, to the Lensman this method of slaughter was crude and amateurish. No such figment of any other mind could harm him unless he knew that it was coming; unless his mind was given ample time in which to appreciate—in reality, to manufacture—the danger he was in. And in *that* time his mind could negate it. He had two defenses. He could deny the monster's existence, in which case it would simply disappear. Or, a much more difficult, but technically a much nicer course, would be to take over control and toss it back at her.

Unhesitatingly he did the latter. In midleap the apparition swerved, in a full right-angle turn, directly toward the quietly poised body of the Lyranian. She acted just barely in time; the madly reaching claws were within scant inches of her skin when they vanished. Her eyes widened in frightened startlement; she was quite evidently shaken to the core by the Lensman's viciously skillful riposte. With an obvious effort she pulled herself together.

"Or these, then, if I must," and with a sweeping gesture of thought she indicated the roomful of her Lyranian sisters.

"How?" Kinnison asked, pointedly.

"By force of numbers; by sheer weight and strength. You can kill many of them with your weapons, of course, but not enough or quickly enough."

"You yourself would be the first to die," he cautioned her; and, since she was en rapport with his very

mind, she knew that it was not a threat, but the stern finality of fact.

"What of that?" He in turn knew that she, too, meant precisely that and nothing else.

He had another weapon, but she would not believe it without a demonstration, and he simply could not prove that weapon upon an unarmed, defenseless woman, even though she was a Lyranian.

Stalemate.

No, the 'copter. "Listen, Queen of Sheba, to what I tell my boys," he ordered, and spoke into his microphone.

"Ralph? Stick a three-second needle down through the floor here; close enough to make her jump, but far enough away so that you won't blister her. Say about fifteen feet or so back— Fire!"

AT KINNISON'S WORD a narrow, but ragingly incandescent pencil of destruction raved downward through ceiling and floor. So inconceivably hot was it that if it had been a fraction larger, it would have ignited the Elder Sister's very chair. Effortlessly, insatiably it consumed everything in its immediate path, radiating the while the entire spectrum of vibrations. It was unbearable, and the auburn-haired creature did indeed jump, in spite of herself—half-way to the door. The rest of the hitherto imperturbable persons clustered together in panic-stricken knots.

"You see, Cleopatra," Kinnison explained, as the dreadful needle beam expired, "I've got plenty of stuff if I want to—or have to—use it. The boys up there will stick a needle like that through the brain of anyone or everyone in this room if I give the word. I don't want to kill any of you unless it's necessary, as I explained to your misbarbered

friend here, but I am leaving here alive and all in one piece, and I'm taking this Aldebaranian along with me, in the same condition. If I must, I'll lay down a barrage like that sample you just saw, and only the zwilnik and I will get out alive. How about it?"

"What are you going to do with the stranger?" the Lyranian asked, avoiding the issue.

"I'm going to take some information away from her, that's all. Why? What were you going to do with her yourselves?"

"We were—and are—going to kill it," came flashing reply. The lethal bolt came even before the reply; but, fast as the Elder One was, the Gray Lensman was faster. He blanked out the thought, reached over and flipped on the Aldebaranian's thought-screen.

"Keep it on until we get to the ship, sister," he spoke aloud in the girl's native tongue. "Your battery's low, I know, but it'll last long enough. These hens seem to be strictly on the peck."

"I'll say they are—you don't know the half of it." Her voice was low, rich, vibrant. "Thanks, Kinnison."

"Listen, Scarlet-top, what's the percentage in playing so dirty?" the Lensman complained then. "I'm doing my damndest to let you off easy, but I'm all done dickering. Do we go out of here peaceably, or do we fry you and your crew to cinders in your own lard, and walk out over the grease spots? It's strictly up to you, but you'll decide right here and right now."

The Elder One's face was hard, her eyes flinty. Her fingers were curled into ball-tight fists. "I suppose, since we cannot stop you, we must let you go free," she hissed, in helpless but controlled fury. "If by giving my life and the lives of all

these others we could kill you, here and now would you two die—but as it is, you may go."

"But why all the rage?" the puzzled Lensman asked. "You strike me as being, on the whole, reasoning creatures. You in particular went to Tellus with this zwilnik here, so you should know—"

"I *do* know," the Lyranian broke in. "That is why I would go to any length, pay any price whatever, to keep you from returning to your own world, to prevent the inrush of your barbarous hordes here—"

"Oh! So *that's* it!" Kinnison exclaimed. "You think that some of our people might want to settle down here, or to have traffic with you?"

"Yes." She went into a eulogy concerning Lyrane II, concluding, "I have seen the planets and the races of your so-called Civilization, and I detest them and it. Never again shall any of us leave Lyrane; nor, if I can help it, shall any stranger ever again come here."

"Listen, angel face!" the man commanded. "You're as mad as a Radeligian cateagle—you're as cock-eyed as Trencos's ether. Get this, and get it straight. To any really intelligent being of any one of forty million planets, your whole Lyranian race would be a total loss with no insurance. You're a God-forsaken, spiritually and emotionally starved, barren, mentally ossified, and completely monstrous mess. If I, personally, never see either you or your planet again, that will be exactly twenty-seven minutes too soon. This girl here thinks the same of you as I do. If anybody else ever hears of Lyrane and thinks he wants to visit it, I'll take him out of . . . I'll knock a hip down on him if I have to, to keep him away from here. Do I make myself clear?"



"Oh, yes—perfectly!" she fairly squealed in schoolgirlish delight. The Lensman's tirade, instead of infuriating her further, had been sweet music to her peculiarly insular mind. "Go, then, at once—hurry! Oh, please, hurry! Can you drive the car back to your vessel, or will one of us have to go with you?"

"Thanks. I could drive your car, but it won't be necessary. The 'copter will pick us up."

He spoke to the watchful Ralph, then he and the Aldebaranian left the hall, followed at a careful distance by the throng. The helicopter was on the ground, waiting. The man and the woman climbed aboard.

"CLEAR ETHER, persons!" The Lensman waved a salute to the crowd and the Tellurian craft shot into the air.

Thence to the *Dauntless*, which immediately did likewise, leaving behind her, upon the little airport, a fused blob of metal that had once been the zwilnik's speedster. Kinnison studied the white face of his captive, then handed her a tiny canister.

"Fresh battery for your thought-screen generator; yours is about shot." Since she made no motion to accept it, he made the exchange himself and tested the result. It worked. "What's the matter with you, kid, anyway? I'd say that you were starved, if I hadn't caught you at a full table."

"I am starved," the girl said, simply. I couldn't eat there. I knew that they were going to kill me, and it . . . it sort of took away my appetite."

"Well, what are we waiting for? I'm hungry, too—let's go eat."

"Not with you, either, any more than with them. I thanked you, Lensman, for saving my life there,

and I meant it. I thought then and still think that I would rather have you kill me than those horrible, monstrous women, but I simply can't eat."

"But I'm not even thinking of killing you—can't you get that through your skull? I don't make war on women; you ought to know that by this time."

"You will have to." The girl's voice was low and level. "You didn't kill any of those Lyransians, no, but you didn't chase them a million parsecs, either. We have been taught ever since we were born that you Patrolmen always torture people to death. I don't quite believe that of you personally, since I have had a couple of glimpses into your mind, but you'll kill me before I'll talk. At least, I hope and I believe that I can hold out."

"Listen, girl." Kinnison was in deadly earnest. "You are in no danger whatever. You are just as safe as though you were in Klono's hip pocket. You have some information that I want, yes, and I will get it, but in the process I will neither hurt you nor do you mental or physical harm. The only torture you will undergo will be that which, as now, you give yourself."

"But you called me a . . . a zwilnik, and they *always* kill them," she protested.

"Not always. In battles and in raids, yes. Captured ones are tried in court. If found guilty, they used to go into the lethal chambers. Sometimes they do yet, but not usually. We have mental therapists now who can operate on a mind if there's anything there worth saving."

"And you think that I will wait to stand trial upon Tellus, in the entirely negligible hope that your bewhiskered, fossilized therapists will find something in me worth saving?"

"You won't have to," Kinnison laughed. "Your case has already been decided—in your favor. I am neither a policeman nor a narcotics man; but I happen to be qualified as judge, jury and executioner. I am a therapist to boot. I once saved a worse zwilnik than you are, even though she wasn't quite such a knockout. Now do we eat?"

"Really? You aren't just . . . just giving me the needle?"

THE LENS MAN flipped off her screen and gave her unmistakable evidence. The girl, hitherto so unmovedly self-reliant, broke down. She recovered quickly, however, and in Kinnison's cabin she ate ravenously.

"Have you a cigarette?" she sighed with repletion when she could hold no more food.

"Sure. Alsakanite, Venerian, Tellurian, most anything—we carry a couple of hundred different brands. What would you like?"

"Tellurian, by all means. I had a package of Camerfields once—they were gorgeous. Would you have those, by any chance?"

"Uh-huh," he assured her. "Quartermaster! Carton Camerfields, please." It popped out of the pneumatic tube in seconds. "Here you are, sister."

The glittery girl drew the fragrant smoke deep down into her lungs.

"Ah, that tastes good! Thanks, Kinnison—for everything. I'm glad that you kidded me into eating; that was the finest meal I ever ate. But it won't take, really. I have never broken yet, and I don't believe that I will break now. And if I do, I'm dead certain that I won't be worth a damn, to myself or to anybody else, from then on." She crushed out the butt. "So let's get on with

the third degree. Bring on your rubber hose and your lights and the drip can."

"You're still on the wrong foot, Toots," Kinnison said, pityingly. What a frightful contrast there was between her slimly rounded body, in its fantastically gorgeous costume, and the stark somberness of her eyes! "There'll be no third degree, no hose, no lights, nothing like that. In fact, I'm not even going to talk to you until you've had a good long sleep. You don't look hungry any more, but you're still not in tune, by seven thousand kilocycles. How long has it been since you really slept?"

"A couple of weeks, at a guess. Maybe a month."

"Thought so. Come on; you're going to sleep now."

The girl did not move. "With whom?" she asked, quietly. Her voice did not quiver, but stark terror lay in her mind and her hand crept unconsciously toward the hilt of her dagger.

"Holy Klono's claws!" Kinnison snorted, staring at her in wide-eyed wonder. "Just what kind of a bunch of hyenas do you think you've got into, anyway?"

"Bad," the girl replied, gravely. "Not the worst possible, but from my standpoint plenty bad enough. What can I expect from the Patrol except what I do expect? You don't need to kid me along, Kinnison. I can take it, and I'd a lot rather take it standing up, facing it, than have you sneak up on me with it after giving me your shots in the arm."

"What somebody has done to you is a sin and a shrieking shame," Kinnison declared, feelingly. "Come on, you poor little devil." He picked up sundry pieces of apparatus, then, taking her arm, he escorted her to another cabin.

"That door," he explained carefully, "is solid tool steel. The lock is on the inside, and it cannot be picked. There are only two keys to it in the Universe, and here they are. There is a bolt, too, that cannot be forced by anything short of a hydraulic jack. Here is a full-coverage screen, and here's a twenty-foot spy ray block. There is your stuff out of the speedster. If you want help, or anything to eat or drink, or anything else that can be expected aboard a star wagon, there's the communicator. QX?"

"Then you really mean it? That I . . . that you . . . I mean—"

"Absolutely," he assured her. "Just that. You are completely the master of your destiny, the captain of your soul. Good night."

"Good night, Kinnison. Good night, and th . . . thanks." The girl threw herself face downward upon the bed in a storm of sobs.

Nevertheless, as Kinnison started back toward his own cabin, he heard the massive bolt click into its socket and felt the blocking screens go on.

V.

SOME twelve or fourteen hours later, after the Aldebaranian girl had had her breakfast, Kinnison went to her cabin.

"Hi, Cutie, you look better. By the way, what's your name, so we'll know what to call you?"

"Illona."

"Illona what?"

"No what—just Illona, that's all."

"How do they tell you from other Illonas, then?"

"Oh, you mean my registry number. In the Aldebaranian language there are not the symbols—it would have to be 'The Illona who is the daughter of Porlakent the potter who lives in the house of—'"

"Hold everything—we'll call you Illona Potter." He eyed her keenly. "I thought your Aldebaranian wasn't so hot—didn't seem possible that I could have got *that* rusty. You haven't been on Aldebaran II for a long time, have you?"

"No, we moved to Lonabar when I was about six."

"Lonabar? Never heard of it—I'll check up on it later. Your stuff was all here, wasn't it? Did any of the red-headed person's things get mixed in?"

"Things?" She giggled sunnily, then sobered in quick embarrassment. "She didn't carry any. They're horrid, I think—positively *indecent*—to run around that way."

"Hm-m-m. Glad you brought the point up. You've got to put on some clothes aboard this ship, you know."

"Me?" she demanded. "Why, I'm fully dressed—" she paused, then shrank together visibly. "Oh, Tellurians—I remember, all those coverings! You mean, then . . . you think I'm shameless and indecent, too?"

"No. Not at all—yet." At his obvious sincerity Illona unfolded again. "Most of us—especially the officers—have been on so many different planets, had dealings with so many different types and kinds of entities, that we're used to anything. When we visit a planet that goes naked, we do also, as a matter of course; when we hit one that muffles up to complete invisibility we do that, too. 'When in Rome, be a Roman candle,' you know. The point is that we're at home here, you're the visitor. It's all a matter of convention, of course; but a rather important one. Don't you think so?"

"Covering up, certainly. Uncovering is different. They told me to

be sure to, but I simply *can't*. I tried it back there, but I felt *naked!*"

"QX—we'll have the tailor make you a dress or two. Some of the boys haven't been around very much, and you'd look pretty bare to them. Everything you've got on, jewelry and all, wouldn't make a Tellurian sunsuit, you know."

"Then have them hurry up the dress, please. But this isn't jewelry, it is—"

"Jet back, beautiful. I know gold, and platinum, and—"

"The metal is expensive, yes," Illona conceded. "These alone," she tapped one of the delicate shields, "cost five days of work. But base metal stains the skin blue and green and black, so what can one do? As for the beads, they are synthetics—junk. Poor girls, if they buy it themselves, do not wear jewelry, but beads, like these. Half a day's work buys the lot."

"What!" Kinnison demanded.

"Certainly. Rich girls only, or poor girls who do not work, wear real jewelry, such as . . . the Aldebaranian has not the words. Let me think at you, please?"

"Sorry, nothing there that I recognize at all," Kinnison answered, after studying a succession of thought-images of multicolored, spectacular gems. "That's one to file away in the book, too, believe me. But as to that 'junk' you've got draped all over yourself—half a day's pay—what do you work at for a living, when you work?"

"I'm a dancer—like this." She leaped lightly to her feet and her left boot whizzed past her ear in a flashingly fast high kick. Then followed a series of gyrations and contortions, for which the Lensman knew no names, during which the girl seemed a practically boneless embodiment of suppleness and grace. She sat

down; meticulous hairdress scarcely rumpled, not a buckle or bracelet awry, breathing hardly one count faster.

"NICE." Kinnison applauded briefly. "Hard for me to evaluate such talent as that. However, upon Tellus or any one of a thousand other planets I could point out to you, you can sell that 'junk' you're wearing for—at a rough guess—about fifty thousand days' work."

"Impossible!"

"True, nevertheless. So, before we land, you'd better give them to me, so that I can send them to a bank for you, under guard."

"If I land." As Kinnison spoke Illona's manner changed; darkened as though an inner light had been extinguished. "You have been so friendly and nice, I was forgetting where I am and the business ahead. Putting it off won't make it any easier. Better be getting on with it, don't you think?"

"Oh, that? That's all done, long ago."

"What?" she almost screamed. "It isn't! It *couldn't* be!"

"Sure. I got most of the stuff I wanted last night, while I was changing your thought-screen battery. Menjo Bleeko, your big-shot boss, and so on."

"You didn't! But . . . you must have, at that, to know it. You didn't hurt me, or anything. You couldn't have operated—changed me—because I have all my memories—or seem to. I'm not an idiot, I mean any more than usual—"

"You've been taught a good many sheer lies, and quite a few half-truths," he informed her, evenly. "For instance, what did they tell you that hollow tooth would do to you when you broke the seal?"

"Make my mind a blank. But

one of their doctors would get hold of me very soon and give me the antidote that would restore me exactly as I was before."

"That is one of the half-truths. It would certainly have made your mind a blank, but only by blasting nine-tenths of your memory files out of existence. Their therapists would 'restore' you by substituting other memories for your own—whatever other ones they pleased."

"How horrible! How perfectly ghastly! That was why you treated it so, then; as though it were a snake. I wondered at your savagery toward it. But how, really, do I know that you are telling the truth?"

"You don't," he admitted. "You will have to make your own decisions after acquiring full information."

"You are a therapist," she remarked, shrewdly. "But if you operated upon my mind you didn't 'save' me, because I still think exactly the same as I always did about the Patrol and everything pertaining to it—or do I? Or is this—" Her eyes widened with a startling possibility.

"No, I didn't operate," he assured her. "No such operation can possibly be done without leaving scars—breaks in the memory chains—that you can find in a minute if you look for them. There are no breaks or blanks in any chain in your mind."

"No—at least, I can't find any," she reported after a few minutes' thought. "But why didn't you? You can't turn me loose this way, you know—a z . . . an enemy of your society."

"You don't need saving," he grinned. "You believe in absolute good and absolute evil, don't you?"

"Why, of course—certainly! *Everybody* must!"

"Not necessarily. Some of the

greatest thinkers in the Universe do not." His voice grew somber, then lightened again. "Such being the case, however, all that you need to 'save' yourself is experience, observation and knowledge of both sides of the question. You're a colossal little fraud, you know."

"How do you mean?" She blushed vividly, her eyes wavered.

"Pretending to be such a hard-boiled egg. 'Never broke yet.' Why should you have broken, when you have never been under pressure?"

"I have so!" she flared. "What do you suppose I'm carrying this knife for?"

"Oh, that." He mentally shrugged the wicked little dagger aside as he pondered. "You little lamb in wolf's clothing—but at that, your memories may, I think, be altogether too valuable to monkey with. There's something funny about this whole matrix—*damned* funny. Come clean, angel face—why?"

"THEY told me," Illona admitted, wriggling slightly, "to act tough—really tough. As though I were an adventuress who had been everywhere and had done . . . done everything. That the worse I acted the better I would get along in your Civilization."

"I suspected something of the sort. And what did you zwil . . . excuse me, you folks . . . go to Lyrane for, in the first place?"

"I don't know. From chance remarks I gathered that we were to land upon one of the planets—any one, I supposed—and wait for somebody."

"What were you, personally, going to do?"

"I don't know that, either—not exactly, that is. Whoever it was that we were going to meet was going to give us instructions."

"How come those women killed your men? Didn't they have thought-screens, too?"

"No. They were not agents, just soldiers. They killed about a dozen of the Lyrans when we first landed—to demonstrate their power—then they dropped dead."

"Um. Poor technique, but typically Boskonian. Your trip to Tellus was more or less accidental, then?"

"Yes. I wanted her to take me back to Lonabar, but she wouldn't. She learned about Tellus and the Patrol from our minds—none of them could believe at first that there were any inhabited worlds except their own—and wanted to study them at first hand. So she took our ship and used me as . . . as a sort of blind, I think."

"I see. I'm not surprised. I thought that there was something remarkably screwy about those activities—they seemed so aimless and so barren of results—but I couldn't put my finger on it. And we crowded her so close that she decided to flit for home. You drove the ship and picked her up. You could see her, but nobody else could—that she didn't want to."

"That was it. She said that she was being hampered by a mind of power. That was you, of course?"

"And others. Well, that's that, for a while."

He called the tailor in. No, he didn't have a thing to make a girl's dress out of, especially not a girl like that. She should wear glamorette, and sheer—very sheer. He didn't know a thing about ladies' tailoring, either; he hadn't made a gown since he was knee-high to a duck. All he had in the shop was coat linings. Perhaps nylon would do, after a fashion. He remembered now, he did have a bolt of gray nylon that

wasn't any good for linings—not stiff enough. Far too heavy, of course, but it would drape well.

It did. She came swaggering back, an hour or so later, the hem of her skirt swishing against the tops of her high-laced boots.

"Do you like it?" she asked, pirouetting gayly.

"Fine!" he applauded, and it was. The tailor had understated tremendously both his ability and the resources of his shop.

"Now what? I don't have to stay in my room all the time now, please?"

"I'll say not. The ship is yours. I want you to get acquainted with every man on board. Go anywhere you like—except the private quarters, of course—even to the control room. The boys all know that you're at large."

"The language—but I'm talking English now!"

"Sure. I've been giving it to you right along. You know it as well now as I do."

She stared at him in awe. Then, her natural buoyancy asserting itself, she flirted out of the room with a wave of her hand.

AND KINNISON sat down to think. A girl—a kid who wasn't dry behind the ears yet—wearing beads worth a full-grown fortune, sent somewhere—to do what? Lyrane II, a perfect matriarchy. Lonabar, a planet of zwilniks that knew all about Tellus, but that Tellus had never even heard of, sending expeditions to Lyrane. To the System, perhaps not specifically to Lyrane II. Why? For what? To do what? Strange, new jewels of fabulous value. What was the hookup? It didn't make any kind of sense yet—not enough data.

And faintly, waveringly, barely impinging upon the outermost, most

tenous fringes of his mind he felt something: the groping, questing summons of an incredibly distant thought.

"Male of Civilization . . . Person of Tellus . . . Kinnison of Tellus . . . Lensman Kinnison of Sol III. . . Any Lens-bearing officer of the Galactic Patrol—" Endlessly the desperately urgent, almost imperceptible thought implored.

Kinnison stiffened. He reached out with the full power of his mind, seized the thought, tuned to it, and hurled a reply—and when *that* mind really pushed a thought, it traveled.

"Kinnison of Tellus acknowledging!" His answer fairly crackled on its way.

"You do not know my name," the stranger's thought came clearly now. "I am the 'Toots,' the 'Queen of Sheba,' the 'Cleopatra,' the 'Elder Person' of Lyrane II. Do you know me, O Kinnison of Sol III?"

"I know you," he shot back. What a brain—what a *terrific* brain—that sexless woman had!

"We are invaded by manlike beings in ships of space, who wear screens against our thoughts and who slay without cause. Will you help us with your ship of might and your mind of power?"

"Just a sec, Toots—*Henderson!*" Orders snapped. The *Dauntless* spun end-for-end.

"QX, Helen of Troy," he reported then. "We're on our way back there at maximum blast. Say, that name 'Helen of Troy' fits you better than anything else I have called you. You don't know it, of course, but that other Helen launched a thousand ships. You're launching only one; but, believe me, Babe, the old *Dauntless* is *SOME* ship!"

"I hope so." The Person of Lyrane II, ignoring the byplay, went directly to the heart of the matter in

her usual pragmatic fashion. "We have no right to ask; you have every reason to refuse—"

"Don't worry about that, Helen. We're all good little boy scouts at heart. We're supposed to do a good deed every day, and we have missed a lot of days lately."

"You are what you call 'kidding,' I think." A matriarch could not be expected to possess a sense of humor. "But I do not lie to you or pretend. We did not, do not now, and never will like you or yours. With us now, however, it is that you are much the lesser of two terrible evils. If you will aid us now, we will tolerate your Patrol."

"And that's big of you, Helen, no fooling." The Lensman was really impressed. The plight of the Lyranians must be desperate indeed. "Just keep a stiff upper lip, all of you. We're coming loaded for bear, and we are not exactly creeping."

Nor were they. The big cruiser had plenty of legs and she was using them all; the engineers were giving her all the oof that her drivers would take. She was literally blasting a hole through space; she was traveling so fast that the atoms of substance in the interstellar vacuum, merely wave forms though they were, simply could not get out of the fier's way. They were being blasted into nothingness against the *Dauntless*' wall shields.

And throughout her interior the Patrol ship, always in complete readiness for strife, was being gone over again with microscopic thoroughness, to be put into more readiness, if possible, even than that.

AFTER a few hours Illona danced back to Kinnison's "con" room, fairly bubbling over.

"They're marvelous, Lensman!" she cried, "simply *marvelous*!"

"What are marvelous?"

"The boys," she enthused. "All of them. They're here because they *want* to be—why, the officers don't even have whips! They *like* them, actually! The officers who push the little buttons and things and those who walk around and look through the little glass things and even the gray-haired old man with the four stripes, why they like them all! And the boys were all putting on guns when I left—why, I never *heard* of such a thing!—and they're just simply *crazy* about you. I thought it was awfully funny that you took off your guns as soon as the ship left Lyrae and that you don't have guards around you all the time because I thought sure somebody would stab you in the back or something, but they don't even want to and that's what's so marvelous and Hank Henderson told me—"

"Save it!" he ordered. "Get back, angel face, before you blow a fuse." He had been right in not operating—this girl was going to be a mine of information concerning Boskonian methods and operations, and all without knowing it. "That's what I have been trying to tell you about our Civilization; that it is founded upon the freedom of the individual to do pretty much as he pleases, as long as it is not to the public harm. And, as far as possible, equality of all the entities of Civilization."

"Uh-huh, I know you did," she nodded brightly, then sobered quickly, "but I couldn't understand it. I can't understand it yet; I can scarcely believe that you all are so—You know, don't you, what would happen if this were a Lonabarian ship and I would go running around talking to officers as though I were their equal?"

"No—what?"

"It's inconceivable, of course; it

simply couldn't happen. But if it did, I would be punished terribly—perhaps, though, at a first offense, I might be given only a twenty-scar whipping." At his lifted eyebrow she explained, "One that leaves twenty scars that show for life."

"That's why I'm acting so intoxicated, I think. You see," she hesitated shyly, "I am not used to being treated as anybody's equal, except of course other girls like me. Nobody is, on Lonabar. Everybody is higher or lower than you are. I'm going to simply love this when I get accustomed to it." She spread both arms in a sweeping gesture. "I'd like to *squeeze* this whole ship and everybody in it—I just can't wait to get to Tellus and really *live* there!"

"That's a thing that has been bothering me," Kinnison confessed, and the girl stared wonderingly at his serious face. "We are going into battle, and we can't take time to land you anywhere before the battle starts."

"Of course not. Why should you?" she paused, thinking deeply. "You're not worrying about *me*, surely? Why, you're a high officer! Officers don't care whether a girl is shot or not, do they?" The thought was obviously, utterly new.

"We do. It's extremely poor hospitality to invite a guest aboard and then have her killed. All I can say, though, is that if our number goes up, I hope that you can forgive me for getting you into it!"

"Oh—thanks, Gray Lensman. Nobody ever spoke to me like that before. But I wouldn't land if I could. I like Civilization. If you . . . if you don't win, I couldn't go to Tellus, anyway, so I'd much rather take my chances here than not, sir, really. I'll *never* go back to Lonabar, in any case."

"At a girl, Toots!" He extended

his hand. She looked at it dubiously, then hesitantly stretched out her own. But she learned fast; she put as much pressure into the brief hand-clasp as Kinnison did. "You'd better blast off now, I've got work to do."

"Go anywhere you like until I call you. Before the trouble starts I'm going to put you down in the center, where you'll be as safe as possible."

THE GIRL hurried away and the Lensman got into communication with Helen of Lyrane, who gave him then a resumé of everything that had happened. Two ships—big ships, immense space cruisers—appeared near the airport. Nobody saw them coming, they came so fast. They stopped, and without warning or parley destroyed all the buildings and all the people nearby with beams like Kinnison's needle beam, except much larger. Then the ships landed and men disembarked. The Lyrans killed ten of them by direct mental impact or by monsters of the mind, but after that everyone who came out of the vessel wore a thought-screen and the persons were quite helpless. The enemy had burned down and melted a part of the city, and as a further warning were then making formal plans to execute publicly a hundred leading Lyrans—ten for each man they had killed.

Because of the screens no communication was possible, but the invaders had made it clear that if there were one more sign of resistance, or even of nonco-operation, the entire city would be rayed and every living thing in it blasted out of existence. She herself had escaped so far. She was hidden in a crypt in the deepest subcellar of the city. She was, of course, one of the ones they wanted to execute, but finding any

of Lyrane's leaders would be extremely difficult, if not impossible. They were still searching, with many persons as highly unwilling guides. They had indicated that they would stay there until the leaders were found; that they would make the Lyrans tear down their city, stone by stone, until they were found.

"But how could they know who your leaders are?" Kinnison wanted to know.

"Perhaps one of our persons weakened under their torture," Helen replied equably. "Perhaps they have among them a mind of power. Perhaps in some other fashion. What matters it? The thing of importance is that they do know."

"Another thing of importance is that it'll hold them there until we get there," Kinnison thought. "Typical Boskonian technique, I gather. It won't be many hours now. Hold them off if you can."

"I think that I can," came tranquil reply. "Through mental contact each person acting as guide knows where each of us hidden ones is, and is avoiding all our hiding places."

"Good. Tell me all you can about those ships, their size, shape and armament."

She could not, it developed, give him any reliable information as to size. She thought that the present invaders were smaller than the *Dauntless*, but she could not be sure. Compared to the little airships which were the only flying structures with which she was familiar, both Kinnison's ships and those now upon Lyrane were so immensely huge that trying to tell which was larger was very much like attempting to visualize the difference between infinity squared and infinity cubed. On shape, however, she was much bet-

ter; she spread in the Lensman's mind an accurately detailed picture of the two space ships which the Patrolmen intended to engage.

In shape they were ultrafast, very much like the *Dauntless* herself. Hence they certainly were not maulers. Nor, probably, were they first-line battleships, such as had composed the fleet which had met Civilization's Grand Fleet off the edge of the Second Galaxy. Of course, the Patrol had had in that battle ultrafast ships which were ultrapowerful as well—such as this same *Dauntless*—and it was a fact that while Civilization was designing and building, Boskonian could very well have been doing the same thing. On the other hand, since the enemy could not logically be expecting real trouble in Dunstan's Region, these cans might very well be second-line or out-of-date stuff—

"Are those ships lying on the same field we landed on?" he asked at that point in his cogitations.

"Yes."

"You can give me pretty close to an actual measurement of the difference, then," he told her. "We left a hole in that field practically our whole length. How does it compare with theirs?"

"I can find that out, I think," and in due time she did so; reporting that the *Dauntless* was the longer, by some twelve times a person's height.

"Thanks, Helen." Then, and only then, did Kinnison leave his private conning room and call his officers into consultation in the control room.

He told them everything he had learned and deduced about the two Boskonian vessels which they were about to attack. Then, heads bent over a visitank, the Patrolmen began to discuss strategy and tactics.

TO BE CONTINUED.

IN TIMES TO COME

NEXT month sees Dr. E. E. Smith's "Second Stage Lensmen" getting into full swing, with the full scope of the problem the Lensmen have to solve revealed. That Smith's yarn is worth following, you already know. I'd like to add this, though: don't wait until you're too late to catch the issue—and better store the copies containing that story when you get them. Invariably, the back-number department at Street & Smith here runs out of the back copies containing Smith's yarns long before the demand runs out. And we always lay down an extra-large supply of those issues, too!

The lead novelette next month is one worth grabbing, too. Vic Phillips has a whole series of highly interesting concepts worked into a fast-action story. "Defense Line" concerns a troop of asteroid hillbillies—men and women who have, for four hundred years, been forced to survive as outlaws on the asteroids. Out of touch with the civilization of Earth and the planets, thrown entirely on their own resources, they've *had* to learn how to wring a living from the barren rock and metal of the asteroid worlds. They've had to adapt themselves, breed into themselves new and strange powers—

And it's partly because of those powers that they were able to be—Defense Line for the Planets, when trouble came from Outside—

THE EDITOR.

ANALYTICAL LABORATORY

As is typical of the point-scores when the competition is hot and close, the points totaled higher this month. No score, you'll notice, below 2.00. Heinlein's "Methuselah's Children," Asimov's "Nightfall" and Saunders' "Elsewhere" in particular distributed the firsts, seconds and thirds among themselves with resultant increase in individual total points. In turn, all up and down the list, there were firsts and seconds—and a considerable diversity of opinion. But it finished up as:

Place	Story	Author	Points
1.	Methuselah's Children	Robert Heinlein	2.05
2.	Nightfall	Isaac Asimov	2.45
3.	Elsewhere	Caleb Saunders	3.41
4.	Mission	M. Krulfeld	4.51
5.	Adam And No Eve	Alfred Bester	4.72

Incidentally, Asimov tells me there's one thing the current war has done for him. He can now tell people where he came from. He left Russia at the arthritic age of two years; previously it's been difficult to explain just where he started. Now he can just say, "A few miles south of Smolensk," and it makes sense. And he's probably the only Asimov of military age who is neither in the Red Army nor playing dumb all day and sniping Nazi supply trains all night. His home town is full of Asimovs, and technically in German hands. Our local Asimov's still undrafted, due to his chemical work here.

THE EDITOR.



YOU CAN'T WIN

By Malcolm Jameson

When a big-time crooked gambler runs up against a space navigator's computation of curves as applied to gambling devices—he can't win!

Illustrated by Kolliker

It's tough to be broke on Venus! They never . . . well, hardly ever . . . give you a break there. It's always the old army game.

Larry Hoyt was the first to come to. And for a long time he wished he hadn't, for his head ached abominably, his mouth was filled with fuzz

that tasted like Eros swamp water, and he knew that those hot pains down in his belly could only come from an injection of concentrated lye. But after a while he ungummed one eye and blearily looked around.

For a minute or so the smoke-filled, dank air revealed nothing; then he saw he was in a flophouse—one of the joints down in the Asiatic quarter. The walls were lined with bunks, and every bunk held an inert form, stentoriously and alcoholically snoring. The soggy floor was paved with other prone forms—last night's sweep-up of the better—or shall we say, less bad—dives. A bartender with a conscience or with some glimmering of pride in the reputation of his house must have, in each case, called in one of the harpies waiting outside and flung him a quarter of a sol to take care of the souse until he woke up again. It was Venus' only concession to decency, but made virtually necessary by the deplorable tendency of men to die when bounced unconscious out into the soup-paved dark alley of the City of Love. The scavenger squad—public health service to you—complained bitterly whenever the night's take of corpses exceeded a hundred.

Hoyt looked, gagged violently, then fell back, weak and jittery. The men in the other bunks were all yellow, red or brown. His pal Jimmy Elkins was not among them. Unless, of course, he was in the bunk underneath; and Hoyt, in his dizzy condition, dared not risk leaning out far enough to look into that. He lay for a little while trying to piece things together, but try as he would, the fog always closed in just as he was about to snatch a scene from the lurid evening before.

Presently an attendant came—an almond-eyed, ocher-faced old man

wearing a robe of cheap blue cotton cloth.

"Makee wakeside, huh?" he demanded, prodding Hoyt in the arm. "Okay, now makee outside. 'Nother man need bunk."

Hoyt groaned and sat up. That time he saw Jimmy Elkins in a far corner of the room, weaving uncertainly on his feet and trying to button up the only buttonable garment left to him—his khaki shorts. Otherwise he was dressed only in a mud-spattered singlet.

"Hey, Jimmy," called Hoyt feebly, "what's the dope? How did we get here?"

"A-a-arh," growled Elkins, "another of your bright ideas. Nothing would do you but we go to the Flying Dragon. The usual thing happened, that's all. You dropped a couple of hundred at the conjunction layout and then balked. So they sicked a couple of cuties on us, and like a damn fool I went with you into the booth. Then—well, blotto. Old stuff."

"Hell," said Hoyt. He had just discovered that his clothes were as incomplete as those of Elkins, and the pants pockets were turned wrong side out.

"Yeah," affirmed Elkins, whose own eyes looked like two fried beets, "and now we gotta get down to the ship—looking like this!"

"We'd better stop off and get a shave first," said Hoyt, rubbing his hand thoughtfully over his quarter-inch beard, "and a raincoat to cover us up with—"

"What with?" snorted Elkins. "We're clean. There's not a sou between us. What's more, the old *Clarissa* may hop off any minute. God knows what time it is—or day, for that matter. Those Mickey Finns the Dragon dishes out are pretty potent."

Hoyt completed his sketchy dressing in meek silence. Then the pair of them followed the silent Oriental to the door. A moment later they were ankle-deep in Venusburg's slime, trudging along through the scalding drizzle that prevailed three hundred days out of three hundred.

"Nopce," said the man at the spaceport gate when they finally reached it. They looked more like studies purloined from a sculptor's studio than men. Wet clay caked them from head to foot. "Your ship—or what you claim was your ship—soared out two days ago. This is Wednesday, you know."

"What!" gasped Hoyt. According to his reckoning, it should have been Monday. "B-but they couldn't. I'm the chief engineer and this is the junior astragator—"

"Was, you mean," snapped the gatekeeper. "These shippers don't monkey around on Venus. You get back on time or else. Get going, you bums, or I'll have you locked up."

"You don't understand," intervened Jimmy Elkins. "The *Matilda* ought to be landing about now. We can explain everything to the skipper and go back on her; she's of the same line, you know."

"Git!" said the gatekeeper, loosening his blaster in its holster.

THE COMPANY'S agents in the Adonis Building were adamant. A rule is a rule, they said. If they started making exceptions, they would never lift another ship off Venus. It was tough, of course, the clerk commiserated, but you have made your bed—now lie in it. Hoyt and Elkins exchanged miserable glances and then slopped their way through the filthy streets to the Terrestrial consulate general.

"Sorry," said the smug messenger,

for the two bedraggled specimens were not permitted to enter the office, "but they can't be bothered. If the consul general undertook to help such cases, he'd have no time for serious work. Sober up, get a job, and then pay your own passage home. It's the only way."

"Damn," remarked Hoyt fervently. They had no choice but to turn away, for a swarthy Sikh cop was making unmistakable gestures with the heavy hardwood club he carried. Venus has small time for those who cannot take it.

"Now what?" asked Elkins. "You've always set yourself up as the brains of this pair. What does the master mind produce to get us out of this?"

"Aw, shut up," growled Hoyt, but he led the way out into the rain. At the next corner he turned to the right and plunged down a sloppy ravine that led to the swamp's edge. They slipped, slid and floundered, but they did not stop until they reached the door of the Flying Dragon, now strangely tawdry in the orange light of Venus' daytime. By night it had—or seemed to have—glamour. Now it was unspeakably cheap and shoddy—a dump, in short.

"Just one more bounce," sighed Elkins as the third series of rappings on the barricaded door brought no response. "That leech Rooney wouldn't give you—"

"Well, what is it?" snarled a voice to one side of them. A hard blue eye was regarding them through a pephole. It was the eye of Mugs Rooney, proprietor of the palace of pleasure known to spacemen of the nine planets as the Flying Dragon.

"I want to talk with you, Rooney," said Hoyt, with as much authority as he could put into his voice. It was a ludicrous attempt from such a dis-

reputable figure. Rooney laughed a short, hard laugh.

"Money talks with Rooney," he snarled. "Show me some and you get in, otherwise I'll call the patrol and have you rounded up as vagrants. Five years in the swamps ye'll get for that. We have bums enough on Venus as it is."

The peephole cover began to close.

"Hold it, Rooney, I'm no bum!" shouted Hoyt, thoroughly angry and cold sober now. "I was here the other night with more than five thousand sols, and before I could spend two hundred of it your thieves drugged me and took it away. I want it, or enough of it to get off this damn planet on. And I mean to have it—"

"Or else?" sneered Rooney with one final show of the eye. Then the peephole closed with a vicious snap. Hoyt stood quivering with impotent rage in the hot rain and cursed the man and all his kind.

"You think of brighter and brighter things every hour," commented Elkins caustically. "What did you hope to get by that? If you had been halfway civil, we might have had a shot and a sandwich for a handout. The worst of them will do that—*once*. At least it would have pulled us through the day."

"Ah, skip it," muttered Hoyt disgustedly.

Then he turned and began the long, slithering climb back up the gully. His anger and disgust were chiefly at himself, for he was too old a spaceman not to know what to expect in a joint like Rooney's. To go, carrying a whole year's pay in his pocket, was no less than rank insanity. Suddenly he sat down in the mud and dropped his face to his hands. Elkins sank helplessly beside him. He was a good kid, in a routine way, but no good in a situation as

bad as theirs. Once down on Venus, and a man was out.

"I'm thinking," mumbled Hoyt when Elkins nudged him once and suggested casting about for something to eat.

The enormity of their position was more apparent every moment. Discharged and black-listed by the spaceship company, they could not hope to get out by working their way. It would take money, and lots of it. Moreover, Hoyt was seething with the desire to avenge his damaged ego. For a man of his experience to be put through the wringer like the rawest rookie or greenhorn cadet! It was intolerable. He wanted to make Rooney pay, and pay through the nose. He wanted to run him out of business. He wanted that worse than to get clear of Venus.

"Let's go see Eddie," he said at last, rising and whipping some of the muck off his legs. He had a plan. It was rudimentary, but a plan.

"Eddie?"

"Yes, Eddie Charlton, master mechanic over at the sky yards. We were buddies at school together, and since then I've thrown him lots of repair jobs."

"That 'buddies at school' business wears pretty thin after a few years on Venus," reminded Elkins, his pessimism deepened by the growing gnawing in his stomach, "but let's go. It's our only chance, as I see it."

THEY GOT their first small break at the gate of the sky yard. The gate-man would not let them in, but he sent for Charlton and he came out. One look at the miserable pair told him the whole story, and he shook his head sadly.

"Sorry, Larry," he said, interrupting the other almost as he began. "I know it backward. It happens ev-

ery month, and there's nothing I can do about it. I only make so much, and I simply cannot carry double. Here's a five-spot for the both of you, and it has to be the last one—"

"Wait, Eddie," implored Hoyt, "you don't understand. I don't want a handout. I want a stake. Enough credit in your shops for a small machine tool job. Do you remember when we studied mechanics and all that stuff about gears and roller bearings and the other parts that went into primitive machinery?"

"Vaguely—under old Professor Tinkham, that was."

"Well, listen—"

Larry Hoyt drew Charlton aside and for fifteen minutes poured forth exposition and impassioned plea. Charlton frowned at first, then nodded from time to time.

"Yes, yes," he agreed, "I see it, but what's the payoff?"

"Rooney will fall for it. It's a gambling gadget, and he'll go nuts over it as soon as it's proved to him that a sucker can't win at it. The beauty of it is that it's strictly on the level."

"I see where Rooney makes a lot of dough, but where do we get off after the manufacturing profit?"

"We won't sell it to him outright—we'll lease it on a royalty basis."

"So you hope to get even with Rooney by making him richer than ever?"

"He won't get as rich as he thinks," said Hoyt cryptically.

Charlton thought it over for a moment. "O. K. You two fellows come in and get cleaned up. You'll look better with those whiskers off and minus a few layers of mud."

Hoyt winked solemnly at Jimmy Elkins.

"First we go to the cleaners, then we go back and take Rooney."

"You tried that the other night," said Elkins sourly.

"I wasn't tooled for it then," laughed Hoyt. Despite his mud-incrusted skin, his aching head, and his complaining insides, he was feeling positively good by then.

"THERE she is," said Charlton a bare four weeks later.

They stood in the assembly room of Shop No. 5. Before them sat a huge silvery bowl, breast-high, and some six feet in diameter. It had a small hole in its bottom, leading to a bucketlike catching basin; its cover was a convex glassite dome. Inside the dome was a cunningly contrived two-armed crane capable of manipulation from the outside. Beside the contraption stood many open boxes containing small balls of uniform size, all highly polished, but of obviously different materials. Some were gold, some were copper, some steel. Others were of white ivory, still others of clear crystal.

"Fine," exclaimed Hoyt.

He was a very different-looking man than when he had first entered the plant. He no longer wore the horribly soiled remnants of the blue space officer's uniform, but the trim brown business suit invariably affected by Terrestrial traveling salesmen. Where he had formerly been what was meant to be clean-shaven, he now wore a snappy mustache. Only people who had known him long and intimately would have been likely to recognize him.

"She's true as a die," expatiated Charlton, "a precision job if we ever turned one out. That bottom curve is mathematically correct to within a few wave lengths of light. She's been buffed until the coefficient of friction is so near zero that you can forget about it. The gillickey on the side is a vacuum pump that keeps the

interior completely exhausted. And we topped it off by putting that continuous camera on the side so that you have a photographic record of both the start and finish. It's strictly on the level, and it can't be monkeyed with."

Larry Hoyt examined it again. He smiled approvingly at the inverse curve that formed the bottom. Most people would have taken it for the lower half of an ellipse. He picked up a couple of balls at random and fed them to the clutching fingers of the small extensible cranes through the air-lock slots available for the purpose. He worked the crane, placing them at random, and let them drop. They rolled down the incline and toward the hole in the bottom. There was a single gentle bong as they hit the concealed bell below.

"Fair enough," said Hoyt. "Load her on a tractor and start her down. I'll go ahead to the Flying Dragon in a rick."

"Good luck to you," wished Charlton with hearty sincerity. "That little job stands us three thousand sols. If your scheme doesn't jell, my head's in the bucket along with yours. We may go to the swamps together."

"Not a chance," laughed Hoyt, and picked up his professional-looking sales kit.

In it were elaborate plates of the equipment that was about to follow him to Rooney's place. Not only that, but he had taken the precaution to have business cards printed, styling himself "Mr. Hoyt, Interplanetary Representative of the Tellurian Novelty Co."

A half-hour later he was seated in the inner den of the notorious Mugs Rooney, face to face with that slippery gentleman himself. Rooney was studying a placard placed before him. His gorillalike eyebrows were puckered into a scowl, and he

chewed his stumpy black cigar viciously. The placard was headed with heavy, bold-face type. It read:

YOU CAN'T WIN!

Positively no magnets or house interference—you do everything—you pick the balls—you place them—you start them off—you say which one is running for the house and which for you—you judge the finish. YOUR BALL CAN'T WIN!

Ten sols a throw—try your skill and judgment. A no-limit game by special arrangement. Come on! If you insist on being a sucker—here's your game.

Because

YOU CAN'T WIN!

"It don't make sense," growled Mugs Rooney, shaking his head dubiously. "It's bum psychology. Why should I clutter up my floor with a machine nobody'll play when I've got to make every square foot pay, what with protection and all? Sure, they're suckers, but where's the percentage in reminding 'em?"

"Did you ever figure how many dimes people feed into the pin games?" countered Hoyt. "And what do they win? Practically nothing. But they keep coming back. Because they hope they will do better next time. It's like that."

"Nope," said Rooney with an air of finality. "Now if you could rig it so that a sucker could win once in a while—"

"That would spoil the whole appeal," said Hoyt. He jerked his chair closer and assumed the air he so often watched in action in the dining saloons of the great Interplanetary liners. "Now, Mr. Rooney, my company is favoring you with a rare opportunity. The machine I am bringing here is the only one of its kind in

existence. You will have exclusive rights. We admit that after a while the novelty will wear off and the customers will stop playing it, but it will be at least a year before the news gets around. For that reason we are not proposing to sell it to you, but lease it. You give us fifty percent of your winnings and you keep the rest. As soon as the take falls below a certain amount we remove the machine. Isn't that fair?"

Rooney scowled some more.

"What about the losses?"

Larry Hoyt smiled indulgently.

"How can there be losses? *You* don't bet you can win—you simply bet the sucker that *he* can't win. On this machine nobody wins. It's always a tie."

"Can't see it," grunted Mugs Rooney, rising.

"It's on the way," insisted Hoyt. "Here's a counter proposition. Let me install it and operate it for three nights. I'll pay you a flat floor rental of a grand a night, banking the game myself. You take over any time you sign the contract."

"Have you got the thousand?" asked Rooney, brightening.

Hoyt dragged it out. It was the last of the stake Charlton had advanced him, less a ten-spot just to cover incidentals. It left him a skinny margin with which to bank a fast gambling game, but he thought it would be enough.

"Bring her in and set her up," said Rooney, pocketing the grand note.

He clapped his hands for the bartender.

"A coupla slugs, Al, for the gent and me. The private stock, you know."

THE Ball Race was the attraction of the evening. After all, a ten-spot was regarded as chicken feed in the Flying Dragon. Human curiosity

being what it is, man after man came up and looked at the machine and wondered why it was unbeatable. So he took a chance. And having taken a chance, he took four or five or ten more. And some very persistent and optimistic drunks took twenty to a hundred.

A typical example was the spare, gray-haired old man who kept strictly sober the whole evening. He seemed to be a student of systems, for he carried notebooks with him and jotted down the play of the machines. For a long time he had been recording the outcome of the Conjunction game—that futuristic offspring of roulette—where nine circles, representing the planets, wheeled at varying speeds and were brought to a halt by chance. The game paid high odds for exact conjunctions, oppositions, quadratures and quincuxes, depending upon the number of planets so related, and lesser odds on approximations within ten degrees. But when he saw the "You can't win," sign he abandoned that table and came over to it.

He watched the game a while, then selected a pair of balls. One was of Venusian mock-ivory, as light as pith; the other of platinum, heavy and compact. He planked down his ten-spot and fed the balls into the machine. The heavier he placed, using the delicate little cranes, at the very top edge of the bowl; the lighter about an inch from the central hole. He released them simultaneously. The heavy ball dropped swiftly, almost straight down, and gained velocity as it sped across the steadily but more slowly declining path. The lighter ball stood almost stationary at the start; then, beginning to move, it rolled lazily toward the hole. The heavier ball caught up with it at the very lip, and they dropped through with a single "*Bong!*"

"Player fails to win," chanted the croupier in his monotonous tones. "He chose the lighter one."

The old man frowned and coughed up another fee. This time he interchanged the balls. The result was identical. He tried two platinum balls, discarding the ivory one. It made no difference. He tried a platinum and a copper one, each placed at an equal height, halfway up the slope. The result was the same.

"It can't be," he muttered, and dug down into his wallet for more funds.

He spent one hundred and eighty sols before he gave it up, baffled. No matter what the initial starting point, or of what material the balls, they always reached the hole at the same instant and fell upon the bell below with a single "*Bong!*" So it went. The more they were stumped, the harder they tried.

"Here's your thousand for tomorrow night," said Hoyt as the last jaded player staggered from the room. It was a one-grand note he had peeled off from the outside of his roll.

"To hell with it!" said Mugs Rooney, "I'm not interested in chicken feed. Here's your contract. I'll take over. You've got something there, brother."

"I thought so," chuckled Hoyt.

That morning he paid his shipyard bill in full. Then he went out and hired an auditor—a man to stand by the machine each night and count the take. Every dawn that man collected the Hoyt half, deducted his own commission, and delivered it.

By the end of the week, Hoyt was not only out of debt, but positively rich. That was when he went into a second huddle with Charlton, and he did not miss having a few words in

private with Jimmy Elkins, who he had been supporting in the interim.

"I don't see it, but I can make 'em," was what Charlton said.

"You're a damn fool, but it's your money," was the Elkins response.

All the reply Larry Hoyt made was a wide and cheerful grin.

IT WAS a night after that Hoyt and Elkins showed up in the Flying Dragon. Hoyt had shaved off his dapper mustache and was once more dressed in the standard blue of a spaceship engineer; Elkins wore the uniform he was accustomed to. Neither had been seen in that make-up since the night of their original downfall; and no one, not even the proprietor, took notice of them. The Venusburg joints were one-shot affairs. They either cleaned you out and wrecked you so that you couldn't come back, or they gave you such a liberal education you rarely ever chose to come back. So they didn't bother to look for old customers at the door.

Both the boys had taken the precaution to stop by the Cupidon bar and have a few, so that they were equipped with an authentic breath appropriated to the time, place and occasion. They affected a slight stagger as they walked.

They each dallied with the Conjunction game awhile, losing several hundred net, despite one brief killing made by Elkins. Then they ambled over to the Ball-Race game, about which were clustered a group of gaping suckers. Hoyt bought a pair of balls and lost. He bought several pair more, with identical results. He quit, apparently disgusted, and the seemingly soused Elkins followed suit. Then Hoyt backed away and reread the sign. It had been amended as he had originally suggested. Tacked to the bottom of

the insolent invitation to play was the following addendum:

IF YOU DON'T TRUST THE HOUSE'S BALLS, BRING YOUR OWN. THERE IS A VENDER JUST OUTSIDE. WE CHARGE FIFTY SOLS FOR VERIFYING THEM. THEY MUST BE OF STANDARD DIAMETER AND WEIGH THE SAME AS OUR BALLS OF SIMILAR MATERIAL.

"Jush-h a minute," slobbered Hoyt, leering at the croupier. "I think I'll try the outside balls. O. K.?"

"Sure," said the croupier, negligently. "But you can't win."

"We . . . hic . . . we'll shee," gulped Hoyt, and staggered for the door.

Presently he was back. In the meantime the chief inspector of Venusian police had come in, accompanied by a couple of deputies. They stood in the background, watching.

"Here's a gol' ball—genuine gold," floundered Hoyt, producing one from his left-hand vest pocket. "I'll back it against anything you've got. Pick your own ball."

"Nothing simpler," said the croupier easily, "but we won't take advantage of you. Commissioner, won't you please pick a ball—any

ball—and place it anywhere? I call on you to be a witness to the fairness of this game."

"Sure," agreed the commissioner, and he picked a bright-red copper ball and placed it. Hoyt set his at random and released the crane grips.

Everybody in the place gasped. For they had just watched the cashier caliper the ball for diameter, and weigh it on micrometer scales with a standard gold ball of the house in the other pan. They matched to the milligrain. Yet Hoyt's ball had lost! That time, for the first time in the local knowledge of the game there had been two bongs on the bell—the first when the house's copper ball had hit it, the other when the slower golden ball had struck.

"Think of that," murmured Hoyt, soddenly, "and I thought I had a sure thing."

He retrieved his ball and stuck it back into his vest pocket. Then he pulled out a flask and took a big drag, glaring all the while at the silver bowl that had robbed him of another sixty sols.

"Hey, wait a minute!" he yelled, suddenly, "I've been gypped. I didn't put it in the right spot. I wanna try again—"

"Why, certainly, sir," said the



Pepsi-Cola is made only by Pepsi-Cola Company, Long Island City, N. Y. Bottled locally by authorized bottlers.

AST—5n

obliging croupier, reaching out for the cash.

"But this time I'm goin' to win—see? Gimme the manager. I wanna shoot the works." He fished out the ball again.

"Just a minute," said the croupier, suddenly hard as nails. "Let's see if that is the same ball."

Hoyt handed him the ball, blindly, and paid no attention while it was being measured and tested. In the meantime Mugs Rooney came up.

"What's the squawk?" he asked, roughly.

"The guy's lost a dime or so. Now he wants the sky for a top."

"Shoot," said the proprietor of the Flying Dragon. Then, sharply to Hoyt, "Where's the dough?"

Larry Hoyt fumbled with his coat, then produced a fat wallet. He slapped it down on the table.

"Never mind counting it," said Rooney, in an off-hand way, with one eye on the police inspector. "We'll do that in the morning when we're making up the deposit. The guy can't win. You know that, don't you, fellow?"

Hoyt cocked a bleary eye.

"Sure, shoot!" he said. The inspector came closer to the table.

Hoyt set the two balls with fumbling hands, then wavered backward and asked Rooney if the house was satisfied.

"Anything's all right," said Rooney, indifferently. "Drop 'em."

IN THE MOMENT of pandemonium that followed, Elkins had a chance to lean over and have a few words with Hoyt.

"How? How did you do it?" he asked, in frank bewilderment. "It was the same ball, I'll swear to that. Once it lost, now it won—"

"I had two balls," whispered Hoyt, "but they were up to specifi-

cations. They were the identical diameter, weight, and had the same degree of polish. Only they were not homogeneous.

"You see, the contour of the bottom of that bowl is that of an inverted cycloid. That is a curve that has the peculiar property of being a tautochrone—that is, any freely rotating object released at any point on its surface and actuated upon by nothing but gravity, will reach the lowest point in exactly the same time as if released from any other point. That is why a platinum ball and a pith ball take the same time, whether let go from the top or at the very brink of the hole."

"Yes," nodded Elkins, "but once your ball went slower and you lost. This time it went faster and you won. How come?"

Hoyt smiled. People were milling about and Rooney looked flustered. He was busy counting the contents of the wallet under the watchful eye of the police inspector. But there was still a moment to talk.

"They weren't homogeneous balls," explained Hoyt. "The total weight was correct, but the first ball had a hollow center, a platinum shell, and a thin plating of gold outside. The other had a solid core, thin pith around it, plus the same outside plating. See? It's all a matter of inertia."

"Inertia?"

"Yes. The sole force acting on the balls was gravity. It could employ itself one of two ways, or a combination of both. It could either impart translation or rotation. On a dense core ball, the resulting movement is chiefly translation, as there is less leverage consumed in the rotation. On the hollow ball most of the energy went into rolling the ball over, and therefore there was little

left available to give it forward speed. Therefore the difference in speed. In homogeneous balls the proportion is the same, whatever the total mass."

"Why, sure. But I wouldn't have thought of that!"

"I figured Rooney wouldn't. I think he is in a jam."

ROONEY was in a jam. He had counted out the contents of the wallet three times and he sat like a fish out of water, gasping helplessly.

"B-b-but I haven't that much," he stammered, "even if I throw the house in."

"You know what we do with welschers in Venusburg," reminded the inspector, sternly.

"Yeah," wailed Mugs Rooney, "but the guy tricked me. Somehow. It's not fair."

"Too bad," remarked the inspector, signaling one of his assistants to produce the irons. "Every man has his turn—you've had plenty. Read the sign up there—"

Rooney, feeling the grip of steel on his wrists for the first time, turned and gazed at his own sign. It said starkly:

YOU CAN'T WIN!

THE END

POSTSCRIPT TO "THERE AIN'T NO SUCH"

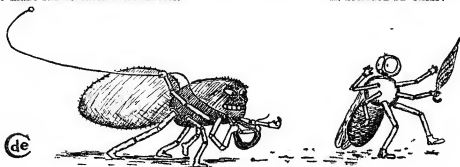
Certain Indian spiders of the genus *Cyclosa* use a unique dodge to avoid the attention of marauding birds and wasps: they make dummy spiders and place them about themselves in their webs. This is not as difficult as one might think. The *Cyclosas* are silvery-gray, about the color of spider silk, and the dummies consist of flies or other prey swathed in silken cocoons.

A spider of Natal, *Menneus camelus*, spins a little rectangular web about the size of a postage stamp, comprising a frame across which about twenty parallel threads are loosely stretched. Catch anything with that? Absurd! But *Menneus* sits quietly with the four corners of the web in her four long forelegs. Comes a victim. *Menneus* pounces, simultaneously spreading the four corners of the web till it is five or six times its former size; then clamps it down over the meal and gathers it in underneath, like a butterfly net.

One big tropical spider, *Cladomela akermani*, spins an even odder "web": she exudes about an inch of sticky thread having on its end a viscid globule the size of a large pin-head. She holds the hither end of the thread in one of her third pair of legs and twirls the thread in a horizontal circle steadily for a quarter-hour. If at the end of that time no insect has flown into this little bolas, she reels in the thread, swallows it and the globule, rests a few minutes, then spins another bolas and repeats the performance.

The allied *Dichrosticus magnificus* of Australia is economical with energy as well as silk. She makes a similar bolas, but instead of twirling it holds it dangling from an extended foreleg until a victim comes within range. Then, *swish!* One more insect has gone to make silk to catch more insects.

L. SPRAGUE DE CAMP.





FINITY

By E. A. Grosser

A handful of Terrestrials on a planet that hated the Terrestrial race—was starting an undeclared war against the Solar System—had to stop the weapon that would explode our Sun—

Illustrated by Kolliker

MARK WILSON frowned. Alison Furness was staring longingly out the Legation window. The street

outside was thronged with the pale-skinned people of Tor, second planet of Tau Ceti. And as the reddish-

yellow sun moved closer to the horizon and the slanting shadows lengthened, the festive tempo was quickening.

"No," he growled.

She looked up quickly. Her smile held a bit of mockery.

"No—what?"

"We can't go out. I don't want to be the main event for a Roman holiday, Tor style."

"Mark," she reproved, "couldn't you merely say it would be dangerous? Do you have to exaggerate every situation with slang?"

"No exaggeration," he barked, grasping her arm and pulling her back from the window.

A heavy stone struck the rubbery plastic and bounced to the courtyard below. He grinned at her wryly.

"That's their sentiment. Stand back so they can't see us, and watch their faces."

The Harvest Festival was the high point of the year for the Torians; and this one, coming at a time when relations between Tor and the Solarian League were already at the breaking point, was packed with explosive possibilities. Most Solarians had been sent home already, but Wilson and the rest of the Legation staff remained, as well as a few private individuals.

The celebrants, in the street, were happy and carefree. The sound of their revelry came dimly to those in the Legation. But Wilson saw the smiles fade from the faces of those who happened to glance at the fortresslike building. And for a moment two blazing dark eyes would gleam balefully in each masklike face. He wondered how seriously the Torian guards in front of the Legation took their orders to protect the building and occupants. Very seriously, he hoped.

Suddenly the sounds of the cele-

bration rose higher with a chilling note of menace. A close-packed group formed in the street as though by magic. Wilson's gaze fastened on the group, then he was leaping to the door.

"Mark!" Alison cried with quick fear.

"Stay there," he snapped. "They've got an Earthman out there."

He pulled the door shut and sped down the stone stairs. He faced the captain of the guards.

"Help that man! Can't you see they're killing him?"

The Torian's military mask was perfect, except for the eyes. And there Wilson saw the same hate as he had seen in the eyes of the celebrants.

"Our orders—" the captain started.

But Wilson saw that there would be no aid. He snatched a bayoneted rifle from one of the guards and ran to the street.

The edge of the group crumpled under his attack. The butt of the rifle struck flesh and bone with a sodden crushing sound. Then they were on him.

The bayonet slashed across a heavy chest, and the squeal of pain sobered the others. Wilson felt something grasp his ankle. A quick glance down, and he saw the withered hand of an old man.

He reached down quickly and yanked the fellow up. The ancient tottered, then Alison was helping him toward the Legation. Wilson backed away from the mob slowly, rifle at ready.

A hard lump of fear formed in his chest at the mass hate which struck at him. But they had lost much of their blood lust at a taste of their own blood. And the three Earth

folk reached the Legation stairs safely.

THE CAPTAIN was gibbering with rage. He snatched away the rifle and tossed it to the guard.

"You . . . you are under arrest!"

Wilson grinned. "Tell it to your state department," he snapped and went up the stairs after Alison and the old man. Diplomatic immunity was very handy.

Secretary Davis and Captain Anders, the military attaché, met them in the reception hall.

"Mark! No one was to leave the building!" The secretary's voice was harsh.

Alison faced him angrily, and she wasn't inhibited by diplomatic rank, as Wilson was forced to be. She said all that he would have liked to say, and a few feminine variations on the theme that he thought very appropriate.

"Did you want us to stand in the window and watch them kill this poor fellow?" she concluded.

"Humph!" Secretary Davis snorted, then turned to Captain Anders. "Well, it isn't Crosby after all."

The captain's face didn't show his disappointment. Together, he and Secretary Davis helped the old man out of the room. The old fellow was gasping, slobbering, in an attempt to speak, but as yet he hadn't succeeded when they went through the doorway.

Alison shuddered and Wilson put his arm around her shoulders. "You shouldn't have followed."

"It was a good thing I did," she countered wanly. "You—" She halted suddenly at another outburst on the street.

Wilson stepped quickly to the window. Another Earthman was

fighting to the sanctuary of the Legation.

"Is it Crosby?" Alison asked.

Wilson shook his head. "Looks like a tourist."

Anyway, the fellow was putting up a good fight, and by the time Wilson reached the door, was running up the stairs. He dashed into the room, panting.

"And to think I left Mars because I thought Lefty could make it hot for me. Thanks a lot, buddy. If you hadn't opened that door then, I'd 'a' come right through it."

Wilson glanced at Alison to see how she was holding up under the slangy speech. She was biting her lower lip, but for another reason, Wilson knew. She was thinking of Crosby. Probably the lieutenant would never report. The mission to the Shiaga Mountains would have been dangerous even in normal times. Now, it was almost certain death. And the Solarian League might never know what it was that was being built so secretly. Rumor said it was a weapon.

Captain Anders entered. His severe face seemed even leaner than before.

Wilson shook his head. "It wasn't Crosby."

"I know; Crosby's here already. Davis wants you."

Puzzled, Wilson followed. The captain opened the door of the coding room and stood aside for him to enter. The old man was stretched out on the table, and Davis was bending over him. The captain gestured toward them.

Davis glanced up, then composed the terrible thin arms and hands of the old man on top of the chest. Wilson knew what the gesture meant.

"Well, Crosby has reported," Davis said.

"When?"

Davis pointed to the old man on the table.

"You're mad!" Wilson burst out. "Crosby was a young man. He—"

Davis had lifted his hand. Resting on his palm was a small pistol-like projector.

"This is what they are building in the Shiagas. Crosby died to get it for us."

Wilson looked at the old man on the table. The body was in the last stages of emaciation. The skin was stretched tightly over the facial bones and the lips were sunken over toothless gums. It couldn't be Crosby!

"Watch," said Davis.

He crumpled a piece of paper and lighted it. Then he tossed it to the floor and leveled the tiny pistol. He pulled the trigger and the paper flared like gunpowder. Wilson turned away from the burst of heat.

When he looked back, the paper was ash and Davis was scraping the toe of his shoe across the spot where it had been. The carpet crumbled away as though rotten with age.

"The combustion is accelerated," he mumbled. "The radiation speeds the action of the atoms."

"You mean molecules," Wilson corrected.

"Atoms," Davis insisted. "Molecular action is secondary. Watch again."

He pointed the tiny pistol at the radium globe in the ceiling and pressed the trigger. The coding room was flooded with a white light so brilliant that it pained the eyes.

Wilson squinted against the glare, trying to see the radium globe. But he couldn't. It had become a blinding miniature sun.

He faced Davis when the older man shut the pistol off. He waited for an explanation. Davis, the stuffy bureaucrat, wasn't in the habit of

making meaningless demonstrations.

Davis passed the pistol to Captain Anders.

"You can guess what will happen to Earth and the rest of the Leagued Worlds when the big projector in the Shiagas is turned on Sol."

WILSON STARED at them. "It'll be a nova," he said huskily.

"Crosby said it was nearly finished," Captain Anders informed gruffly.

Wilson waited. They had some reason for their actions, he knew. And in some manner he was to be a part of them.

But he couldn't keep a vision from showing him a picture of the Solar System, with Sol pouring out the energy of years in one searing blast. A few catastrophic minutes! And every world from Venus to Titan would be a lifeless crisp.

"We've got to get this pistol to Earth. The ship is ready—on the roof. But it will only take two."

"Alison is one," Wilson said immediately. "You'd better be the other. Either you or the captain."

"I'm going into the Shiagas," said Captain Anders.

Wilson looked at him quickly. "What can you do?"

The captain smiled. "Who knows? Probably nothing. Anyway, you'll be here and if you don't hear of a lot of trouble within six hours after I leave—you start out. Now, help me with this butyl, will you?"

Captain Anders stripped and offered Wilson a bottle and a wad of cotton. Wilson took them and, dampening the cotton, started to sponge the captain's body. Wherever the damp wad passed, the captain's flesh assumed a pale, dough-like color similar to that of the Torians.

Davis started to leave, but Wilson halted him.

"Another fellow came in a few minutes ago," he informed.

Davis cursed and Wilson grinned.

"Tourist, I think."

Davis cursed more feelingly.

"Well, he's out of luck. We can't take the time to keep his nose clean now. He stays here with you."

Captain Anders grinned after Davis. "He's got the wind up," he observed. "Best proof that it's really dangerous. He's a physicist, you know."

Wilson nodded and carefully finished the bleaching job. The captain had Torian clothes ready, and Wilson went with him to the side door of the Legation.

The captain peered out on the alley, saw that the way was clear, then shook Wilson's hand in a hasty good-by.

"If you don't hear of trouble, try your luck," he charged.

"O. K." Wilson watched the captain slip down the alley and join the celebrants, then he returned to find Alison. She was sitting alone. Her lips were trembling when she raised her eyes to meet his.

"I'm not going," she said defiantly.

He sat on the arm of the chair. "Listen, sweetheart. This is bigger than any of us. There is a good chance that none of us will live. I can fight better if you're safe. Now make it as easy as you can."

"But, Mark, I—"

"I know. You'd stay here with me. I'm glad you would. But I don't want you to." His smile suddenly seemed to contradict his eyes. "You aren't running away. If Anders doesn't succeed, or I don't, none of us will live. Now you go on home and take your chances there; I stay here and try to make those chances better."

He lowered his head to hers and she clung to him.

"Now be a sweet little prude and beat it," he laughed. He waited expectantly, but she said nothing. "You're losing your grip, Al," he complained. "You haven't jumped me once about slang."

She only held him tighter, then Davis came into the room.

"All ready," he said.

Wilson helped her up, and to the ship on the roof. Then he and the last refugee watched the ship ease into the dark sky. At a safe distance from the surface, the ship suddenly vanished as Davis shifted to the warp drive.

Wilson turned to his lone companion.

"Well, tourist, how do you like this for a spot?"

"Yeah, and I left Mars for my health! But I suppose these dough-faces can't do anything to me that Lefty wouldn't do."

"Who is Lefty?"

"Big-shot bootlegger of Mars. I . . . er . . . expropriated one of his rocketships and a full load of the real McCoy. He didn't like it at all."

Wilson chuckled. "I'll bet not. Then you really aren't a tourist. What is your name?"

"Brady—Pat, of course."

"Good name," Wilson commented.

"Do you like a scrap?"

Brady pursed his lips reflectively. "So-so," he admitted.

THEY BOTH straightened at a banging on the door of the Legation. Wilson glanced out. A group of police had passed the complacent guard and were demanding admittance. He hesitated, then opened the door.

The police pushed past him and the leader confronted him with a

glare that was obviously supposed to be intimidating.

"Where isss Secretary Daviss?"

Wilson shrugged.

"Where isss Captain Anders?"

Wilson shrugged again. Brady chortled at the leader's rising anger, then became abruptly silent when the leader faced him.

"Where isss Undersecretary Wilson?"

"That's me," said Wilson.

The leader smiled at last, though it didn't help his face much. "You will come wiz us," he grinned, then glanced at Brady. "You, also."

Brady's eyes sought Wilson's. There was a question in them. Wilson saw him point unobtrusively toward his shoulder, and for the first time noticed that his coat didn't fit perfectly. Wilson nodded and turned back to the leader.

"You haven't any jurisdiction here, you know. You'll have to answer to my government."

"Phaw!" the leader spat with disgust. "You talk of dead t'ings."

"Yeah?" Brady inquired dryly. "Well, you stand still or maybe we'll be talking about you."

They turned, and gaped at the very businesslike sono pistol in Brady's hand. The leader was the first to recover. He stormed—judiciously. And when Brady lined the pistol up with the leader's eyes, the storming ceased abruptly.

"Stun 'em, Brady," said Wilson.

Brady made the adjustment and pulled the trigger. The police tumbled to the floor and lay very much at ease.

"Good work, Brady," Wilson approved. "Now, come on. We've got to get out of here before their friends get curious. You bleach me, and I'll bleach you."

A few minutes later Brady looked

down at his bleached flesh with an expression of disgust.

"I feel like I'd just crawled out from under a log—a damp one."

Wilson laughed and tossed the gangster some Torian clothes. He found himself liking the fellow, especially since he had told him of the projector in the Shiaga Mountains. Brady had simply taken it for granted that they would go after that.

"Necessary, though. I wouldn't want to go out in the street with a good suntan."

"No. . . . I tried that," Brady agreed.

Silently, Wilson led the way to the door that Captain Anders had used less than two hours previously. He opened it and looked out. The alley was deserted.

"Let's go," he said, slipping out into the darkness.

The alley ended at the thoroughfare in front of the Legation, and that wide boulevard was streaming gutterful with Torians. Wilson halted and looked around. Brady came to his side.

"Do you speak Torian?" Wilson asked in a low voice.

Brady shook his head.

"Then just keep quiet. I'll do all the talking." His hand slid into his pocket and touched the sono pistol he had brought with him. That might have to do some talking, too.

"You know, Wilson, it kinda bothers me—here I am, trying to save Lefty's mangy hide. It just don't seem— Look!"

He was pointing at the entrance of the Legation. It was crowded with police and soldiers. Wilson grabbed Brady's arm and dived into the street crowds.

"Those damned guards must have got suspicious," he growled. "Now, the alarm will go out. We have to

get out of this city—maybe we can steal a car.”

“Just take a taxi and dump the driver later,” Brady advised calmly.

Wilson recognized the superior strategy and flagged an air taxi. They climbed in.

“Want me to take over?” Brady asked. “This is old stuff. I’ve done it lots of times.”

Wilson nodded and wondered who it was that said crime didn’t pay.

THEY LEFT the driver standing in the darkness, miles from the city. And Wilson took the controls. The aircar sped upward and in the direction of the Shiaga Mountains.

Overhead the constellations sparkled much the same as they did on Earth. Ten light-years made little difference in the vastness of the Galaxy.

He saw the faint star that he knew to be Sol. It was two months away for Davis and Alison Furness. But the Torians’ new weapon was even faster, according to Davis.

Wilson wondered if they would arrive, only to find the Solar System a scorched cinder of its former glory.

He seemed to see Alison in the darkness in front of him. She was smiling. Then she frowned, and he smiled. That was the way she always looked when he waxed ungrammatical. He rather wished now that he hadn’t teased her quite so much. It wasn’t her fault that she had taken things too seriously.

“Are those mountains?”

Brady’s voice banished the vision. Wilson smiled at the gangster’s awe. The Shiaga Mountains always inspired disbelief. They loomed into the night sky like a black wall, topped with white-crowned peaks. Mount Tilone, the highest, reached upward nearly eight miles.

Wilson sent the ship higher. The

cold cut in like a sharp blade.

“Can’t we stay lower?”

“We might tangle with a mountain,” Wilson said, teeth chattering.

“What a place to work!” Brady gasped. “I’ll bet those guys don’t commute.”

“It would be just as hard on foot—harder! Crosby’s the only one I know who made it. This way, all we got to do is to see them before they see us—antiaircraft batteries.”

Brady glued his eyes to the panorama below. But it was nearly morning before they sighted a cup-like depression far to the south. A valley, gleaming metallically in the starlight and too perfectly formed to be natural. Wilson shut off the motor and glided closer.

A slender tower of red metal stood in the center of the valley. But Wilson could see no sign of sentinels as he approached as close as he dared and landed. They stepped out of the car, onto the wind-slicked snow. The wind whistled around them like a malevolent demon.

“Got your sona pistol?” Wilson asked, mouth close to Brady’s head.

Brady nodded, then demanded, “But who we going to shoot? I don’t see anybody.”

“All underground,” Wilson explained. “But we aren’t after them. We’ll find a likely spot and try to start an avalanche. Delay is all we need.”

They found a snow-laden crag that suited their purpose. Wilson warned Brady to find a secure footing, then they adjusted the pistols to maximum power and directed a steady stream of vibrations at the base of the crag.

For long seconds there was no result. Then rocks scaled from the spot under fire. The entire crag leaned forward as though bowing re-

spectfully. There was a cracking rumble and the whole mass of stone and snow sped down at the valley with a ground-shaking roar.

The rock beneath their feet trembled. The rushing mass gathered substance and power. It foamed into the smooth valley like a great solid wave, sending out boulders that bounded ahead like military scouts.

Then it reached the base of the tower and Wilson's heart leaped with exultation.

But the avalanche parted and swept on. The tower stood unmoved. Wilson's triumphant grin faded. He stared. But it was Brady who put their thought to words.

"That shoulda jarred a mountain loose," the gangster mumbled.

Wilson didn't answer. He turned slowly and started along the ledge. They must do it the hard way. He called to Brady to follow.

They toiled over the rough stone and smooth ice and snow. A numbness was easing the cold. And Wilson knew that they must hurry. But he halted suddenly and stared at the rim above. For a moment he had seen a figure silhouetted against the lightening sky.

Then he saw another. They turned back the way they had come, and hadn't gone a hundred feet before they faced a fur-clad Torian officer and a squad of men.

The officer's eyes were mocking as one of the men stepped forward and cautiously took the two sono pistols. They hadn't a chance. The rifles of the others covered them steadily.

"Careful," warned the officer, "or you won't survive to meet your friends. It's a good thing you've come. They are almost senile."

Wilson and Brady marched doggedly ahead of the Torians. And Wilson wondered if one of the men

the officer had referred to could be Captain Anders.

THEY MARCHED down a long tunnel, until Wilson judged that they must be below the valley. Brighter lights shone ahead of them, and they passed other Torians. He caught glimpses of machine shops, barracks, a huge power station.

Slowly, he realized that this huge project had not been undertaken in response to the demand of the people. The gigantic weapon was finished! And it must have taken years to build. More probably, the popular sentiment was a carefully planned excuse to use the terrible weapon.

They were thrust into the same cell. After the soldiers had withdrawn and the jailer returned to his cubby, a cracked voice called:

"Wilson . . . Wilson! Was that you?"

Wilson admitted that it was, and the voice continued: "I'm Anders. Did you have any luck?"

Wilson recognized the voice, though it seemed different from before. He answered with a discouraged, "No."

Then he saw Brady grinning at him. The fellow was sitting on the lower bunk, unlacing one of his shoes. Wilson wondered if the man had gone crazy. Then he turned away.

"What are you so low for?" the gangster asked. "Hell, I been in lots of jails."

Wilson didn't reply.

"And I got out of lots of them," continued Brady, tugging at the shoelace to straighten it. The flexible plastic hummed like a violin string. "Mostly since I took to old-fashioned shoes—no zippers for me."

Wilson faced the man, and watched him fix a noose in one end of the shoelace. The flexible plastic slid easily. Brady tossed the noose

over his foot a couple of times as though practicing, then went to the cell door and leaned idly against the bars.

But it was hours before the gangster had his chance. The jailer came down the aisle, the keys jingling at his side. He started past.

Brady's hand darted between the bars. The loop settled over the jailer's white throat and drew tight. Strangling, the Torian fought the cord, but Brady drew him to the bars.

"Get the keys!"

Wilson obeyed eagerly and a few moments later the cell door was open and the Torian lay unconscious on the floor. Wilson went to free the other prisoners while Brady knelt to search the jailer.

The first was a tottering ancient who stumbled forward and grasped Wilson's arm.

"I had to!" the old man cried, lips trembling. "They made me. Please don't stare at me! I tell you I had to!"

Wilson freed his arm and went to the next cell. The old man followed, pleading and wailing. The second cell opened. Another old man came out, face working, hands twitching.

Wilson stepped back in disgust. They were mad. Not dangerously so, it seemed; but mad nevertheless. He hurried on to the next cell. They followed at his heels.

"I tell you I had to! I tell you I had to! You gotta believe me. I had to!"

"Shut that guy up!" hissed Brady.

"Just say you believe them, Mark, and they'll shut up," came Captain Anders voice from the cell. "They are about all in."

Wilson stared at the man inside. He was fully ten years older than Captain Anders and yet—

"Don't recognize me, do you?" the man asked with Captain Anders' voice. He was smiling crookedly as he stepped out. "I don't blame you. Some of the things they have here can't be completely shielded. They used me for a couple of tests." He glanced at the old men. "They got a worse jolt. The Torians used psycho-control on them when Earth got the works. They were Crosby's men."

"Got Earth! What do you mean?"

But a freezing coldness within Wilson was growing with his suspicion.

"I didn't want to!" shouted the old man. "You believe me, don't you? *You got to!*"

Wilson hastily assured the old man and turned back to Anders.

"I thought you knew," the captain said. "Earth is gone. They got it last night—and caught Davis' ship in the beam."

Wilson was dazed. He couldn't think clearly.

"But we've still got a job to do," Captain Anders snapped. "I told you they were testing. They are getting ready to clean out our Centaurian colonies. There won't be an Earthman left in the Galaxy when they are through. We've got to wipe *them* out!"

"But how?"

"If we can get to the controls, the beam would strike Tau Ceti at noon. These fellows say they know how."

"How many more prisoners are there?" Wilson's voice was hard.

"No more."

Wilson turned and together they walked toward the outer door. The old men trailed meekly. Brady was just getting to his feet, and he was cursing fluently.

"This guy didn't have a gun."

"Torian jailers never have," Captain Anders said, then reeled against

a cell as the floor rocked to an explosion.

Wilson stumbled and struck his head against the bars, but he didn't even feel pain. It couldn't be that the Toriaus knew of the break. And besides, they would not use explosives.

HE PUSHED himself up and climbed to his feet. The floor quivered to a more distant explosion. Then the sound became a mumbling thunder, continuous, almost rhythmic.

"Trouble!" shouted Wilson, leaping at the doorway. "It's our chance!"

Captain Anders herded the old men into the corridor and shouted directions to Wilson. Wilson halted and grasped one of the old men by the arm. They went faster.

But a uniformed figure blocked their way. And a rifle was held low. A harsh snarl commanded them to halt.

They had no choice. Wilson looked again at the uniform, unbelievably. Then he stepped forward, starting to speak.

"Halt! Hey, you!" The stranger glanced at the old men. "Come over here. But stay out of the way or I'll shoot through you."

"I didn't want to. They made me. I didn't want to. You believe me, don't you?"

The soldier shoved the old man aside gently.

"Sure, dad, I believe you. And they won't make you do anything more. Now, get back there, you white-livered sons—"

Wilson wanted to laugh. A League soldier! One of their countrymen! And it looked as though he was going to get them back against the wall and shoot them down.

But, in a way, he didn't particularly mind. There was no home. Earth was gone. And the same bitterness that made the soldier's face a hard mask took from him all desire to live. But Captain Anders wasn't so complacent.

"You fool!" he barked. "We're Earthmen. I'm Captain Anders and this is Mark Wilson. We're both of the Legation staff."

The soldier's eyes widened. He lowered his rifle, half turned and

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shouted: "Here's the bunch they want aboard the *Sonora*."

Others came at a run. And Wilson and his companions were taken to the surface. They stood on the ridge above the valley as one of their escort signaled to someone in the valley of the projector.

Wilson went to the edge and looked down. Two battleships bearing the insignia of the Solarian League had landed. They lay beside the tower.

"Warn them! They've got to get out of there. If the Torians turn that thing on—"

The soldier helped them into the landing car with a laugh. "Nothing would happen."

An elderly man greeted Wilson at the flagship, seized his hand. "Mark! It was always hard to believe that you might be here, waiting for us somewhere on this planet."

"D-Davis?" Wilson stammered.

"So I haven't changed too much," the other chuckled.

"But—you were caught in the beam!"

"Lucky thing, too. You see, that field accelerates *everything*. It has an effect on physical manifestations analogous to that of heat in ordinary chemistry. But it is basic. It spread to cover the whole Solar System and I had a hard time making them believe that anything had happened. Now we know more about it than the Torians ever did. We've had thirty years to study and build; while you, here, had a few days."

Wilson remembered Alison viv-

idly. Oh, she had been beautiful. But that was just it. She *had* been beautiful. Thirty years was a long time.

Davis turned. "Oh, Alison!" he called, then faced Wilson again. "She enlisted, so when I found I was coming along to conduct the peace negotiations, I had her assigned to my ship. Sort of keep an eye on her—see that she doesn't get in trouble. Oh, Alison!"

"Ahh, keep your jets cool!"

Wilson winced. He wanted to run. It was too horrible to be real. She couldn't have waited for him! And even if she had, he didn't want to wait for her. Certainly not, if she still needed watching.

But the woman who came forward was the Alison he had known. He looked into her eyes and offered hosannas to science. What wouldn't they do next? She wasn't a day older. He took her in his arms.

Then he was nursing a stinging cheek. And Alison was retreating, head high.

Wilson turned to Davis, but the elderly man was red-faced and wouldn't meet his eyes.

"You . . . uh . . . see, Mark. Alison Furness and I were married. That is Alison Davis—our daughter."

Wilson didn't answer. He was staring at Alison. He could have sworn that she had smiled.

"I'm really sorry, Mark," Davis mumbled.

"Forget it." She *had* smiled.

THE END.



DIRECT ACTION

By John Hawkins

Willie wasn't very bright, and the only methods he understood were those his underworld training had taught him—gangster tactics. But against the group he had to fight, gangster tactics were the right answer!

Illustrated by Kramer



WILLIE WALDMER had no business on the old cliff road in the early morning. You found Willie, normally, in one of the red-leather chairs at Jake's Horse Parlor, in a front-

row seat at the burlesque, or making a tricky draw shot to drop the three ball in a corner pocket for a buck on the side. Yet here he was, marching through a strange, barren

country, pointing his two-tone shoes down the dusty road to nowhere.

It wasn't his fault. This guy—this Max—looked like any Joe Farmer, dough-heavy, and made to order for a smart operator. Willie gave him the old business. He had one right out of the hat, the feed box, and straight from the horse's mouth. A shoo-in at thirty to one. It was strictly routine, up to there, but the farmer came up with a wad of folding money. "Here," he said. "Bet this for me. On the nose!" And Willie knew what it was like to hit the jackpot.

Willie was far too smart to bet five hundred, in real money, on a tip of his own. So he went through the motions and he tucked the dough safely in his pocket. The dog came home, twenty lengths in front, and things came unstuck. Joe Farmer—this Max—turned out to be a very tough boy from the East, and not a guy you could pay off with a cry story about how the window was slammed down in your face. He wanted his fifteen grand. Willie didn't have it. Willie no longer had the five hundred. He'd been suckered into betting on the favorite by a guy who had it straight from the jockey that this one was in the bag.

So there was Willie, miles from anything that made sense, leaning on the top of a low stone wall. Sea gulls wheeled above him, fleecy clouds sailed across blue sky, and surf made a creamy lace at the foot of the cliff, far below. But scenery was strictly for chumps. Willie watched the small, dark man.

This guy was about as big as a nickel beer. He'd popped up out of nowhere, lugging a little black bag. He trotted out to the cliff edge and left a shiny can there. Then he moved back to a place near the road. He sat down in the deep grass,

opened his bag, and became very busy.

"A crack pot," Willie decided. "A screwball!"

Wharrroommm! The ground did a brisk rumba under Willie's feet and concussion knocked him flat on the seat of his pants. For about ten seconds, Willie's muscles did his thinking for him. He was deep in the nearest bush, quaking there, before the first echo came smashing back. And it was a long time before Willie dared lift his head and venture a look around. The road was still empty of cars. There was no sign of Max.

"What the hell?" said Willie.

And he stayed where he was. Willie had lived on South Street. He'd seen many a package tossed through the windows of joints owned by guys who didn't believe in buying protection. Flame, smoke, great slamming noises, and a certain destruction of bystanders had resulted. So there was no mistake. This thing that had flattened Willie was a package. But where was Max?

Willie peered cautiously from his hiding place. The little guy was putting out toward the cliff edge where huge dust clouds masked the rim. After a time, the dust blew away, and Willie could see that a great chunk of the cliff was gone—just gone—at about the spot where the shiny can had been.

"So," said Willie. "He makes packages."

He had the answer and he felt better. This small, dark guy was a professor—South Street had a number like him. He'd come out here looking for a quiet place to test his product. Some stuff, thought Willie, remembering the size of the can. And then, since a smart operator never knows when he'll have

need of a superior package, Willie settled down to watch.

THE SMALL, dark man left another can standing on a knob of rock. He put something, a paper-wrapped something, under a rotten log. He trotted back to his bag and busied himself there—and the can exploded with a thunderous roar and a spouting gush of crimson flame. Part of the cliff edge vanished. The earth was still bouncing when the log tore itself apart and took wing. Willie spent a bad minute dodging stray chunks of it.

"Professor," he said to himself, "I got a sneakin' hunch a smart guy like me can use a guy like you—"

Simple caution took Willie in a wide detour to come up behind the little guy. Even a screw ball—and these professors were all nuts—knew you needed plenty of room to handle a package. You can't toss a couple of pounds of big noise at a guy who's practically standing in your lap unless you want to butter yourself over considerable ground. "O. K.," thought Willie, "I'm as safe as if I were in my mother's arms." But he didn't believe it. His knees wobbled as he tapped the small man's shoulder.

"Hi," he said weakly. "Hi, professor."

The small, dark man glanced briefly at Willie. "How do you do," he said in a squeaky, little-boy voice, and went on writing rapidly in a black notebook. Willie scratched his head and waited. There couldn't be much harm in the guy after all, he reflected. He wouldn't go more than a hundred pounds, soaking wet. He looked like an out-of-work beer-garden fiddle player—bushy hair, mustache, bright button eyes, and a much-patched coat.

AST—6a

"You zaw my experiments?" the professor asked.

"I seen 'em," Willie answered. "Yeah."

He moved closer to the black bag and the gadget that stood in the grass beside it. The thing was a toy machine gun, as near as Willie could tell. It had a flimsy tripod; a long, slim barrel of metal with about six inches of stiff, shiny wire sticking out of one end, and a pistollike grip on the other. A fat cable ran from the bag to the butt end of the barrel. That, for some odd reason, made the hair crawl on Willie's neck.

He swallowed. "What's this gim-mick?"

"That's the Fourth Principle."

Willie said, "I see." But he didn't.

The professor scrambled up. "You are the first to witness my triumph. Ja!" He leered at Willie. "Soon all the world will know. And soon the oppressor nations will beg for mercy from the mother country. Soon—"

"What kind of soup was that?" Willie asked.

"Zoup!" said the professor, startled. "Zoup?"

"That stuff in the can?"

A light dawned in the professor's eyes. "Oh! You mean the can I exploded. That was oil. Engine oil."

"And I'm Garbo," said Willie.

"But Garbo is a woman. She—"

The professor was slow on the uptake, but he got it. His eyes snapped; he whirled to fumble in the bag. He pushed a quart can under Willie's nose. "Hah!" he said. "Read the label."

"Four Star Oil," Willie read aloud.

THE PROFESSOR punched a hole in the top of the can. He poured some of the contents on Willie's hands. The stuff looked like oil; it smelled

and tasted like oil. Willie said as much. And the professor told him to take the can out and place it on the cliff edge.

"Me?" Willie croaked. "Yuh mean me?"

"Ja," said the professor firmly. "You!"

Willie's voice failed him. He turned dumbly to obey, though he had a mental picture of himself vanishing in a puff of crimson flame and a thunderclap all his own. He told himself oil couldn't explode. Then he remembered what he'd seen and heard and cold sweat ran down his back. He put the can on a boulder, edged gingerly away, and then galloped back to the professor's side.

"Now," said the professor. "You shall see."

The professor seated himself back of the toy machine gun. He turned a tiny crank on the side of the barrel. The stiff, shiny wire which protruded from the tip split, spreading in a V. The professor squeezed the trigger. Nothing happened. Nothing. No sound came from the gun. No crackle or hum. No smoke or fire.

"So," said Willie. "The old run-around."

Wharroommm! The earth and sky traded places. Flame made a scarlet fan across Willie's horizon, and the ground came up and belted him solidly in the face. Tons of rock dropped away from the cliff edge and went roaring into the sea. Not until all was quiet did Willie lift his head and spit the grass from his mouth.

"It blew up," said Willie. "Yeah."

"Ja. My projector will explode any substance, liquid or solid, that is controlled by the Fourth Principle. And from a safe distance."

"I don't get it."

"But you just saw—"

"I seen the can go boom," Willie agreed. "I seen yuh foolin' with that gimmick. But that's all I seen."

"Gott, man, you—" A frown channeled the professor's brow. He started over. "My projector is a device which broadcasts the impulse I have named the Fourth Principle. Ja! And the atomic structure of oil—"

And, right there, Willie fell off the sled. Atomic structure, impulses— Willie was snowed under. Only part of what the professor said made sense, and that in a kind of cockeyed way. You wanted to blow up a can of oil. You pointed the gimmick—the projector—at it; you pressed the trigger. *Wham!*

"O. K.," said Willie. "What else'll it do?"

"I haff tried to tell you," said the professor in disgust. "It needs no outside power source. It acts as a detonator for gasoline, oil, or any of the common types of explosive. And it is the weapon which will weld the world into the New Order."

"Maybe you got somethin' there. Yeah."

The professor looked at Willie as he might have looked at a child. "I haff time," he said. "I will show you more. Much more."

THEY PLACED new packages of the professor's on the cliff edge—cans of oil, gasoline, and, widely scattered, several half sticks of dynamite. They went back to the projector and the professor opened the black bag to show Willie the metal box from which the insulated cable sprang. Two dials and a toggle switch were set in its top.

"This dial controls the power," the professor said. "With this one you vary the distance at which the projector functions—from five feet to

fifty miles. This switch turns the the set off and on. It is simple. No?"

"No," said Willie. "Let me try it."

"Ja. But once only."

Willie sat on the ground back of the projector. The professor adjusted the dials; he touched the switch and a tiny red light glowed there. Willie peered down the shining barrel, noting that the open V of silver wire gave him a wide aiming area. He pressed the trigger and swung the barrel. Gouts of flame spouted from the cliff edge. The earth shook and a thunderous roaring battered at Willie's ears.

"*Tsk*," said Willie. "Some gadget."

The professor muttered agreement. He was busy writing in a little notebook. Willie studied the dials. He stared at the projector. A faint droning caught his attention, and he looked up to see a monoplane heading toward them from the distant hills, its silver wings agleam in the sun.

Willie cocked his head. "Did yuh ever try to see how far away this gimnick'd make somethin' blow apart?"

"I haff had no chance."

"This's the dial you turn for that, ain't it?"

"Ja," said the professor.

Willie spun the dial until it caught against the pin. He boosted the other a little, too. Flattening on the grass, he pointed the barrel at the hill, squinting over the sights. The monoplane, tiny and distant, flew into the open V, and Willie inched the barrel in slow swing, holding it there. He pressed the trigger.

"Hey," he said. "Take a look."

The professor cried out in horror. Black smoke belched from the plane—greasy smoke, shot through

with tongues of red and yellow. It came apart, suddenly and completely, as though batted by a giant hand. Rolling across the miles, came the deep booming of the explosion. And then the sky was empty, save for the wind-torn puff of smoke.

"It works swell," said Willie.

The professor made a strangled sound and reached for Willie with clutching hands. "Gott! You haff blown up the plane. You haff killed my friends!"

Willie edged away. "It was a accident."

"They were coming to take me home," the professor said. "I haff finished my work here. I haff obtained all the material for my projector. I—" He paused, looking very sick. "But the Leader will know. Everywhere he has ears. Someone will haff to pay for this!"

"I got a buck 'n' a half," said Willie.

"Fool!" blazed the professor. "Idiot!"

"Take it easy," said Willie from a safe distance. "These things happen. Here today an' gone tomorrow, I always say."

The professor was inconsolable. He looked, Willie thought, like he'd been hit with an ax. He paced with bent head and clenched hands between the projector and the cliff, paying no attention to Willie's practical advice. Nobody could be sure who gave the plane the hotfoot, could they? O. K. So why cry over spilled—well, spilled airplanes?

"You must come with me," said the professor.

"With—you?" Willie echoed, hollowly.

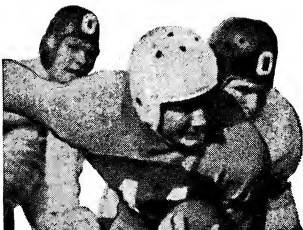
"Ja. To the police of my country."

"I got a better idea," said Willie. "Let us two make a deal. There's a guy named Max that's tryin' to put

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the finger on me. He's a very tough boy and—"

"Nein," said the professor. "You must pay!"

Willie thought fast as they marched up and down the swale. "Why don't we jus' skip the whole thing?" he asked as they reached the cliff edge again. "You could toss the gimmick off here an' it'd bust in a million pieces. Then nobody could prove nuthin'. Sure." He pointed. "Jus' toss her down there."

The professor leaned out. "Where?"

Willie put his hands on the professor's back and pushed quickly. "Where you're goin'," he said. "Yeah."

SOUTH STREET was surprised to see Willie. The whispers had gone the rounds. "He clipped a pal of the boss!" Black cars had cruised in search of him. And sullen men, with meaningful bulges under their breast pockets, had asked pointed questions. South Street, in view of this, had been expecting a front-page picture of Willie—as the X in one of those X-marks-the-spot things.

But here he was, jaunty and smiling, carrying a little black bag. Old friends and acquaintances turned pale and ran like rabbits for the nearest cover. Only a few, like Legless Joe, news dealer and bookie, stayed around when Willie showed up. Legless Joe wasn't able to move out rapidly, which was probably the reason, so he suggested to Willie that since a cripple couldn't move, Willie do the moving.

"Beat it," he growled. "Shove off."

Willie said, "Where's Max?"

"You ain't sucker enough to look for him?"

"I want to see the guy," said Willie. "Yeah."

"He went out to the Island. Him'n the boys." Joe moved close on the roller skates which served him as legs. "You better scram while you're still all in one chunk."

"I like it here. I'll see yuh around."

"I make it ten to one you won't."

Willie thought about that. "At ten to one it's a steal," he said. "I'll buy twenty bucks worth of that."

Dusk had drawn a gray curtain across the land when Willie finally climbed the low hill, miles north of the city. Below him lay the river. And the Island was there—a green ship forever sailing full against the buffeting current. The windows of the boss' summer home looked out on the river with yellow eyes. Other lights, in pairs, marched across the slender bridge to the mainland.

Willie had once been a guest on the Island; he knew how things were done there. The boss had a liking for trained dice. Strictly, he said, as a gag. But if a guy was dope enough to squawk, the boss was apt to give him the hotfoot—with a blowtorch. The boss was like Max, only worse. Much worse.

Using field glasses, Willie found Max's car, long, blue, bulletproof. It was parked beside the boss' big sedan, a black job, which could easily have doubled for a tank. Willie opened the bag, assembled the projector, and settled down to wait.

It was dawn before the first automobile engine awoke on the Island. Willie flipped the switch on the metal box; he twisted both dials. He turned the tiny crank, opening the V on the barrel tip as wide as it would go. He found the trigger.

"O. K.," he said. "Project."

Whispering seconds ticked into eternity—and then the gloom of the courtyard was ripped and torn by a burst of yellow flame. Another and another. A deep and solid roaring filled the valley. It looked, from where Willie sat, as though a busy little section of hell had moved in down there. He watched with great interest.

"*Tsk,*" he said. "I hit the jackpot."

SOUTH STREET rejoiced—and wondered. According to newspaper reports, the first cautious investigators found evidence of a fierce battle. Craters yawned in the courtyard. Every car on the Island had been blown to bits. The boss, Max, and a number of muscular men who worked for them were listed as missing. "Scattered" would have been a better word.

Legless Joe was sad. "You should live so long!" he told Willie and counted out two hundred dollars. "A man can't depend on past performances no more. Max 'n' the boss're gone, an' you're still around. Hell—it's like if a truck horse wins the Kentucky Derby." He paused. "Two guys was lookin' for you this mornin'. Big guys."

Cautiously, Willie said, "Yeah?"

"For you 'n' a black satchel."

Chills like tiny mice feet ran up Willie's spine. The two guys, he learned by further questioning, were big, blond, and one of them had three small scars on his cheek, and a behind-end-to way of talking. They'd come hunting anyone who disliked the boss and who'd been seen, recently, with a square, black overnight bag. They were friends of the professor, Willie decided. An' they were probably mad about what'd happened to the plane, an' the professor.

"You ain't seen me," said Willie.

"I ain't," Legless Joe agreed. "But they want to buy the bag. One of 'em had a roll as big's your head."

"That's different," said Willie. "Yeah."

Joe grunted. "I tol' 'em to come baek at noon."

THE TWO MEN were waiting when Willie sauntered up, at noon. Big and stiff-backed, they were as alike as two oysters. They bowed. "Zo glad!" they said, and carted Willie off to a nearby bar.

"Scotch," said Willie. "If you're buyin'."

"Of course." The scarred man did the talking; he leaned close to whisper hoarsely, "You have the bag?"

"Bag," said Willie. "What bag?"

The scarred man looked puzzled for a moment. "Ah, yes," he said, and smiled. They both smiled. They didn't look like oysters now, Willie decided. More like sharks.



"You think of the one who . . . ah . . . fell over the cliff," the scarred man said. "And of the plane. You think perhaps we are angry. No?"

"No," said Willie.

The scarred man tried again. They were men of the world, he said. Accidents were to be regretted, but they should not hinder the smooth course of business. That one of the cliff, the plane—these were but trifles. No?

"Yes," said Willie. "How much?"

"Ah—twenty thousand dollars."

Surprise made Willie speechless. The scarred man mistook silence for doubt. He smiled quickly. "Thirty," he said. "Thirty-five thousand dollars."

Willie got the idea. "I'll sell for fifty."

"Done!" said the scarred man.

The smooth-faced one said, "Heil, Hit—" and his companion slammed him in the ribs. "Now," he said to Willie. "When can you . . . ah . . . demonstrate? When can we get the bag?"

"Midnight," said Willie. "You come down to Front Street. A kind of alley runs into the bluff there. You take the path that leads around back of Hogan's warehouse. I'll be waitin'."

"Midnight," said the scarred man. His companion muttered, "Heil." "Bring the dough," said Willie.

THE service-station operator looked at Willie. Then he looked at the ten-dollar bill; at the bag, new and shiny, which stood on the counter. "What's the use of puttin' oil in a suitcase?" he asked. "Le' me go get your car an—"

"In there," said Willie. "Fill her up."

The operator said, "O. K. You're the doctor."

"Tonight I'm a professor," said Willie. "Yeah."

A dusty slice of moon leered over the low hills, shedding a wan light as Willie hurried toward the river. He avoided Front Street and the path which circled Hogan's warehouse. He went directly through the gloomy building—having a certain useful skill with padlocks—and let himself out the back door where the alley cut deep into the hill to a dead end. He sat on the bag to wait.

The tower clock bonged midnight. Gravel rattled off on the left. Willie heard a panted curse. It'd be a little tough, he reflected, for two big guys to squeeze through, between



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the back of the warehouse and the cliff. The scuffling grew louder.

"I hope they don't get stuck," Willie said.

They came out of the dark together. They smiled at Willie, but Willie didn't smile back. They looked, he thought unhappily, like the guys who'd worked for Max. They circled, blocking the alley, and then came straight toward him. The chill and tiny mice feet were busy on Willie's spine again.

"You have the bag?" the scarred man asked.

"You have the dough?" Willie countered.

"You will be paid. Ja!" The scarred man's hand shot out to catch Willie at the throat and yank him from his seat on the bag. He laughed and shook Willie until his teeth rattled. "Paid!" he said again. "Ja!"

"Take it easy," Willie gasped. "You—"

"Get the bag," said the scarred man.

"I haff it," said his companion.

"And we are through with this carrion!"

The scarred man gave Willie a sweeping push that sent him back against the hill. A big, black gun appeared in his hand. Willie ducked and rolled. The gun went off and something bit a piece out of Willie's ear. Willie doubled himself into a tight ball, diving for the shelter of a convenient boulder. The gun spoke again. Willie felt as though he'd been hit across the seat of the pants with a red-hot wire. He lay very still.

"His mouth is closed," said the scarred man.

Rapidly retreating footsteps told Willie he was safe, but he stayed where he was, hugging the shelter of the boulder. The two men were

nearing the mouth of the alley. Willie peered up. Above and ahead, where the hill bulged outward, the moonlight gleamed on shining metal. The projector was there, braced on its flimsy tripod, the long barrel pointing at the alley mouth, the trigger held down by a stout rubber band.

"Ten feet," said Willie. "Maybe nine."

The two men were running. Scarface looked back, lifting his hand. It was as if he pulled a great, roaring sheet of flame down from the sky to swallow the two of them. A howling crater yawned at the alley mouth; one wall of the warehouse was blown in. Willie dodged bits of timber and plank.

"*Tsk*," he said. "I got stuck for the oil."

Legless Joe was closing his newsstand for the night when Willie came limping down South Street. Legless Joe looked at the black bag Willie carried. Then he rubbed his jaw and scowled.

"How'd you make out?" he asked.

"No deal," said Willie.

"What was that noise I heard a while ago?"

"That was it," said Willie. "No deal."

SIX BLOCKS from Legless Joe's corner, twin green lights marked South Street's police station. There, in the privacy of his office, Police Captain O'Hara talked with Sergeant Jones.

"It's a mess," said O'Hara bitterly. "The boss is gone. Who's everybody goin' to pay protection to? Where am I goin' to get my cut? How'm I goin' to make the payments on my new car?"

"We could sell protection," the sergeant suggested. "We could make

more money if we cut out the middle-man."

The captain considered it. "It ain't dignified," he said, and frowned blackly. "Who do you suppose got the boss? And how'd they do the job? What'd they use?"

"A butter knife, maybe. He was sure spread thin."

The captain glared. "I hear Willie's back."

"He's around. I seen him."

"Was he carryin' a little black bag?"

Sergeant Jones nodded. "He was. Yeah."

"Good," said the captain. "He was around askin' for Max just be-

fore hell busted loose out on the Island. An' one of the boys seen him heading toward the river just before Hogan's warehouse was blown in. He had the bag both times. And he carried it awful easy, like it was full of eggs. Or packages."

The sergeant swallowed. "Look, I—"

"You go haul Willie in. I want to talk to him."

"How'd it be if we wait a couple of days. I—"

"You ain't scared of that little squirt?"

"No-o-o," said the sergeant.

"That is—not much. I get to rememberin' what happened out on the Island and I ain't achin' to get me spread over a couple of blocks."

"He's harmless. He won't give you any trouble."

"You wouldn't," Jones asked, "want to come along?"

The captain said, "I wouldn't. Not tonight."

Thus it was Sergeant Jones who made the long climb up darkened stairs to the door of Willie's room. Half a dozen harness cops were bulked solidly behind him—quite a little way behind him, for they, too, had heard rumors about Willie's little black bag.

"Shssh!" said Sergeant Jones. "Quiet now!"

He approached the door on tip-toe. He stooped to peer through the keyhole. The harness cops waited, peering up, uneasily eying the sergeant's bulk. Slow seconds ticked away. Then, suddenly, the silence was broken by the roaring of gunfire. The sergeant howled.

"I'm shot!" he bellowed. "He got me!"

He headed for the street, moving fast, and the cops grouped on the stairs were quick to follow. It



looked, they told the captain later, like the start of a flanking move and they wanted to be right on the sergeant's heels so as to miss none of the action.

"Did Jones have his gun out?" the captain asked.

A cop gulped. "Nope. It was in his hip pocket."

Captain O'Hara wiped his face with a shaking hand. "It don't make sense," he said. "The gun was in his pants. He don't touch the thing, but it goes off anyway. It gets him six times—right where he sits down!"

WILLIE WALDMER awoke to hear gunfire outside his door. Cold panic tied his stomach in knots. Shivering, he reached for his trousers, intending to depart by way of the fire escape. Then came the trampling rush that was Sergeant Jones in full flight, and Willie remembered the projector. It stood on a chair beside the bed, its dials set to the lowest range and power, and it was pointed at the door. Somebody—some cluck with a gun—had sneaked within range. The projector had done the rest.

"Some gimmick," said Willie admiringly. "Yeah."

He risked a cautious glance from the window, saw blue uniforms clustered on the walk, and knew with a sinking feeling who his visitors had been. "Maybe," he told the projector, "you 'n' me got this town wore out. We'd better find some place else to play."

The next noon found Willie, a disgruntled Willie, talking to Legless Joe from the shelter of a nearby doorway. "So I figured I'd join the army," he said. "I got somethin' they c'n use, see. I go up an' talk

to the guy. You know what that guy told me?"

"I c'n guess," said Legless Joe.

"He said if I took a deep breath it'd kill me."

"An' now what?"

Willie didn't answer for a time. He was reading the black headlines of the papers spread on Legless Joe's stand.

**LONDON BOMBED!
HITLER SCOFFS AT TREATY!
WAR SPREADS TO EAST!**

"That Hitler's just like Max," said Willie. "He's got a lot of heels workin' for him. Two of 'em tried to pull a clip racket on me. It's about time somebody put th' old bounce on him." Willie paused, hefting the black bag. "Yeah," he said, and a thoughtful shine came into his eyes. "It's jus' about time."

"Well?" said Legless Joe.

"Which way's London from here?"

Legless Joe pointed. "That way."

"O. K.," said Willie. "I'll see yuh around."

Legless Joe looked at the little black bag. He shuddered. "It'll be O. K. with me if you don't," he said.

IT WAS but a few minutes later when Captain O'Hara stopped to buy a late edition. "You ain't seen Willie, have you?" he said. "I been wantin' to talk to him."

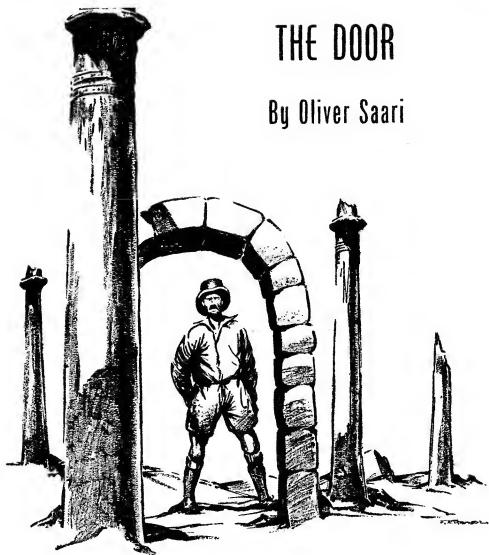
Legless Joe shook his head.

Captain O'Hara looked relieved. "We'll grab him one of these days." He unfolded his paper. "Hm-m-m. This Hitler's really moppin' up. Maybe he'll win this war."

Legless Joe sent a glance up the street where Willie had so lately vanished. "Maybe," he said. "But me, I make it forty to one he don't—"

THE DOOR

By Oliver Saari



The fabled Door led through to another, stranger world. And, most important, it led away from the death-thirsty desert he was on, the legends claimed—

LIGHT in the Igidi Desert was a monstrous thing, thought Whalen; shimmering from the white-hot sand, dancing on an uncertain horizon, painting mirage after mirage to the blistered vision of the man who staggered there.

Whalen sank to his knees on the rippled sand and attempted to squeeze the last hot drops from his canteen. One—two—three—there were no more. He licked cracked lips to save the pearls of moisture from the greedy wind.

A mile to his left was a gash of green; palms, their tender stems stooping under the weight of the sky—blue water—shadows. The picture danced on the heat haze. Whalen laughed at it. At first he had pursued it. Now it pursued him. It was a mirage, a jest, a laughing taunt of the Great Igidi. The torment of Tantalus.

Even had it been real, it wasn't what Whalen had been seeking.

Now that death was near and most other things remote, Whalen found in his mind a great unity of purpose. The thing he was seeking was real. Unlike the mirage it was near and it existed. And it offered hope, a chance of escape from this hell of sand and sky.

The fierce-eyed Sheik had told him that. Yes, the Igidi held the temple of the forgotten worship of the ancient Berbers. He himself had seen it: the center of the blasphemous cult of the oldest white race, the thing they had believed in before the Arabs had shown them Allah.

It had been false, the Sheik said, and thus it had died. There remained only the ruins and the *Door*, the portal which was the symbol of the old religion. But it was all evil and false. Its prophets had been condemned to the Seventh Hell of Mohammed. Even the oasis had been destroyed, the desert washed clean by the breath of Allah. Only the ruins and the sand remained.

The Sheik had been very devout, and had washed his beard and his hands and his feet with sand, and faced the direction of Mecca.

But he had robbed Whalen just the same. Had taken his water and camels. The Sheik had a right to them, of course, because he had a long, curved knife and Whalen's rifle was in its scabbard. Whalen knew the art of gracious giving and was,

therefore, still alive.

"You may have the water in your canteen, Christian Dog," the Sheik had said. "May you find the Door and walk through it, for it opens not into Heaven as its prophets claimed, but into the Seventh Hell!"

THE SHEIK had jested. Whalen loved a jest. If one must be robbed, it is better by a good-natured robber, he thought.

Without water, without camels he didn't have a chance of beating the Igidi—unless he found the Door. The Sheik had given him the canteen and pointed a direction. That was his jest. That was the chance he had given Whalen: to find what he thought was the portal to the Seventh Hell.

Of one thing Whalen was sure. The Door, into which thousands of worshipers and, eventually, the prophets had vanished, did not lead into the Seventh Hell, but into another physical plane of existence. After piecing together thousands of words of disconnected legend, that was the conclusion he had reached. The Sheik had told him nothing he had not known before.

Back in civilized Morocco Whalen had thought only of the records, of a possible clue to the origin of the white Berbers. Now, in the vastness of the Igidi, he could think only of death and of the Door. Because the Door meant life. If it still existed, it was a short cut out of this place of thirst and heat.

The canteen flopped against Whalen's thigh with an empty sound. He threw it into the sand and paused to watch the drift cover it up. Empty, dry sustainer of life, it had failed in its duty and now it was dead. Whalen laughed out loud, though the effort was agony in his throat. He was a little mad. He

thought it would not be so bad dying if it could be in jest.

Then he moved on, stumbling on the ripples. He changed his course often to keep from traveling in circles. The mirage of green palms still pursued him.

Suddenly it was replaced by ruins. Gray and brown weathered stone standing against a hot sky. Whalen ran three steps, then saw the tell-tale fading of the image. Another mirage, more cruel, more torturing.

Heat. Heat. Molten gold pouring down a sand-strewn valley, engulfing him. Whalen could no longer see, but feeling was intense. This was not a jest; this was death. He was dead, but his legs moved on. Night would not come; even in death there was sun and light. It had been cool nights years ago and there would be no more nights. Only day—day—

HE STUMBLED onto something hard. Under his hands was stone. It had no meaning to him; he was dead. Then suddenly it had meaning.

Whalen tried to see, but the white pain of heat blindness was in his eyes. He could feel with his hand, though, and it was rough-hewn stone he felt.

Then he could see. He was in the middle of it and it was not a mirage. Stone pillars, human artifices, works of man here in the middle of Hell. They did not belong there, they could not be.

But the stone pillar before him cut off the sun. Whalen lay in its shadow, his face in the sand. Feeling returned; at first pain, then thought and memory.

Ruins!

With that thought came life and energy to Whalen. He staggered to his feet and stared at the pillars. Seven of them there were, ten feet high and three feet thick. Behind



Who's hearing today?

● With the Parker sisters—Emily, Margaret, and Gertrude—you'd keep forgetting which one was deaf and which one was blind. They had a habit of seeming to trade names...

● They kept a genteel boarding house in the town where Webb Curtain worked as a garage mechanic. And if Webb Curtain could have known—could have guessed—what the three sisters were doing...

● Well, read it yourself. It's a grand story, called BIT OF TAPESTRY, by Cleve Cartmill, in the December issue of

Unknown Worlds

AT ALL NEWSSTANDS

them was an arched stone doorway, standing alone, and then seven more pillars. There were suggestions of other shapes around, but all were covered with sand. The pillars and the door were in a hollow amid the dunes, as if the drifting sand dared not approach the portal.

The Door!

A shower of hope dissolved the bony hand of thirst that clawed at Whalen's throat.

It was insane to believe in an ancient Berber legend, but he believed. Here was proof. Beyond that door existed another plane.

The arched doorway was seven feet high and—empty. Through it showed the desert, but the image wavered like a heat haze. Whalen walked past the pillars and around in back and it was the same.

Had pilgrims walked through this portal into nothingness as the legends said, in the days when Egypt was yet unborn? Where did it lead? Who had built it?

Then Whalen's nostrils caught the scent of alien atmosphere.

It came from the Door, an intangible odor that was not of this desert. It came on a wind, wafted through the film of nothingness that veiled the portal.

Whalen could scarcely find strength to stagger to the portal. For a moment he paused to look back past the pillars.

The mirage was gone. Only the

white-hot sky and the shifting dunes remained as far as the eye could see. The vast Igidi, cruel and unbeatable. He had beaten it! He had conquered thirst and had reached his goal. The Door would cheat the Igidi of its victim. Whalen laughed with new sound. It was a jest and this time the joke was on the desert!

With new strength he turned and walked to the very edge of the shimmering nothingness that was the dividing line. There would be no returning. The ancient prophets had said the Door led into Heaven. The Sheik had said—

He was through. There was only a slight feeling of vertigo and then he was in a new plane of existence.

Whalen turned. He had walked through the door, but it was not behind him. Behind him was nothing.

Above were two suns, one orange and one yellow. The sky was reddish, like a sunset but more intense.

Whalen stood still for a long time. Then he laughed long, till the hurt of it in his throat started bringing darkness to his brain.

Again it was a jest, and again it was on him.

He was not in Heaven, nor was he in the Seventh Hell of Mohammed. The air was hot and the sand stretched on to the horizon, drier then the Igidi. He was in another desert.

THE END



HIGH VACUA

By Henry Bott

A science article on the headaches and triumphs of making practically nothing at all—which is infinitely more difficult of accomplishment than it sounds!

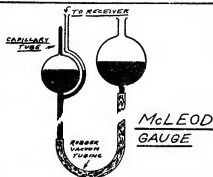
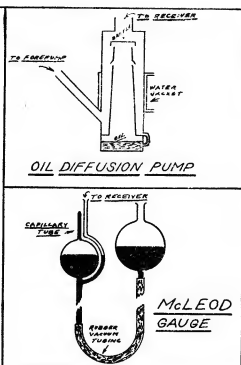
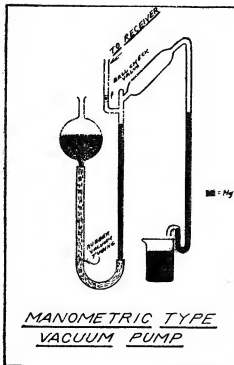
Illustrated by Kramer

MOLECULES in the gaseous state can be devilish little things. They can cause the physicist an extraordinary amount of trouble in his sensitive apparatus. He doesn't want them in his electron tubes, his photoelectric cells, or his cyclotrons as a rule, for when they are hit by other subatomic particles as electrons, they ionize, and when they ionize, the physicist's instruments read like the imaginings of the traditional mad scientist. And so, he makes every effort, conceivable or otherwise, to remove them from his equipment with excellent success, by "simply" reducing the pressure of the atmosphere in his apparatus by a factor of 10^{-12} , at which pressure, tens of millions of molecules exist where formerly there were quintillions. No mean feat, that! And as if not content to rest on his laurels, the physicist has gone so far as to reduce that 10^{-12} to 10^{-14} , which is to say he has succeeded in obtaining a vacuum corresponding to a pressure of one-hundred-billionth of an atmosphere. Or to put it in another fashion; at a pressure of 10^{-14} atmospheres, only one out of every hundred billion molecules remains in the exhausted vessel.

Let us consider something a little more concrete than the vague "vessel"; an ordinary radio tube will do.

Assume this hypothetical tube to have a capacity of, oh—perhaps 250 cubic centimeters, disregarding the elements of the tube. This vessel is filled with air at atmospheric pressure which, for the sake of convenience, we'll say is precisely 760 millimeters of mercury. Incidentally, it is customary to measure air pressures in terms of the height of a column of mercury supported by the air, 760 mm. of which is the pressure of one atmosphere. In the c.g.s. system, the "bar" or the "baryc," equaling pressures of 1,000,000 dynes per sq. cm. and 1 dyne per sq. cm. respectively, are often used, particularly by meteorologists. However, for actual technical work, the "micron," one one-millionth of a meter (.001 mm.) of mercury is the preferred unit.

But to get back to the tube. Exactly what is going on in that vessel? We know, according to the kinetic-molecular theory that those molecules of gas are in exceedingly rapid motion. The molecules move in straight lines until they meet and are deflected by other molecules or



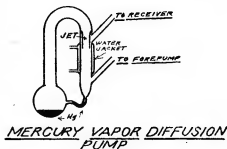
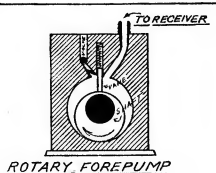
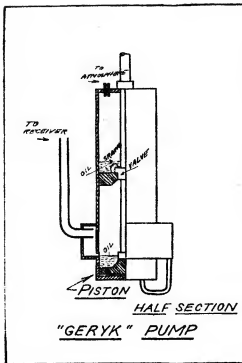
by the walls which retain them. The frequencies of the meetings are so great that the mean free path of the molecules approximates only 10^{-4} mm. By removing as much of the air as possible, we thus not only decrease the frequency of collision, but, consequently increase the mean free path at the very low pressures to a fraction of a meter, allowing for the intervening walls of the vessel. The molecules left will collide with the walls much more frequently than with each other. Obviously, the properties of material particles under these conditions will be radically different. More will be given on this later.

HAVING SEEN a few of the characteristics of a "vacuum," let us delve into the means and wherefores of making "empty space."

The trail that begins with high-

pressure, low-speed piston pumps and ends with low-pressure, high-speed oil-diffusion pumps, introduces Otto von Guericke, the first of the nothing makers.

Von Guericke's first experiments on producing vacua took place sometime in the third decade of the seventeenth century. His original efforts were devoted to endeavoring to pump the water from a water-filled wooden cask by means of a brass leather-valved force pump. Believing that a vacuum should result, he performed the experiment, but failed due to the air penetrating the porous wooden staves. Nothing daunted, he repeated the abortive attempt, using a large water-filled copper sphere. This time he obtained his desired vacuum, though not for long, for as the pumping continued the sphere collapsed into a crumpled mass of sheet metal. Von Guericke



rightly attributed the failure of the sphere to the pressure of the atmosphere's pressure, a notable discovery in itself since he was unaware of the work of Torricelli of Pascal. Later he developed a fairly good air pump, consisting of a cylinder, a piston and two valves; the entire pump was immersed in water to prevent leakage of air through the crude leather valves. It was with such a pump that he entertained the Emperor Ferdinand III at Regensburg, with his well-known "Magdeburg Hemispheres."

Two copper hemispheres, about two feet in diameter, were fitted together with the aid of a waxed leather gasket, and then attached, by means of a valve in one hemisphere to a vacuum pump. It is said that eight horses, pulling together on one of the hemispheres, were unable to break the seal.

AST—7n

Robert Boyle, the English physicist and student of gases (Boyle's Law) became fascinated when he learned of the experiments of von Guericke, and proceeded to perform many experiments with pumps of his own devising. Boyle was intrigued by observations on the effect of reduced pressures on small animal life, and so much of his work followed these biological rather than physical lines. He did, however, make several notable improvements in the vacuum pump and its procedure. The familiar bell-jar and plate of the high-school laboratory is an invention of his. An excellent pump of his consisted of two parallel cylinders, the pistons of which were connected by a rope passed over a pulley above them, so that the air pressure on one piston helped to raise the other, and since, prior to this, the operation of the ordinary

pump had been difficult, it was of great importance.

THE ONLY TYPE of vacuum pump other than the two-cylinder piston pump in use at this period was what might be called the "single-stroke pump," namely, the barometer. A tube, longer than about twenty-eight inches, enlarged and sealed at one end, open at the other, filled with mercury, and inverted in a container full of the same metal, will have at the closed end a "Torricellian" vacuum, which by suitable manipulation may be used in an experiment. The vacuum attained will, assuming no occluded or absorbed gases, be equal to the vapor pressure of mercury at whatever the temperature happens to be. That smoke, dust, and other fine particles obey the law of gravity was shown with this type of pump.

Up until the beginning of the present century, with the exception of certain mechanical refinements, including the application of motor power, almost no radical improvements were made in the two-cylinder piston pump.

The final touch, almost that of perfection, was added to the piston pump by Fleuss, in what he called the "Geryk" pump. This tool, of the double piston type had the ultimate refinement—all air was displaced from the dead portions of the cylinders by oil. This apparently simple change in the pump, requiring only a low vapor pressure oil, was capable of attaining pressures of the order of .2 microns. These pumps were widely used at one time in the evacuation of incandescent lamps, but have been superseded by the more efficient rotary and diffusion pumps.

From the latter half of the nineteenth century on, mercury pumps,

utilizing the principle of connecting the receiver with a Torricellian vacuum, were developed; their use was essentially confined to the physical laboratories of the time. Most of the early experimentation on electrical discharges through gases at low pressures were done with this pump. J. J. Thompson's work on the electron was done with the aid of this type of pump. It may be recalled that Edison's first incandescent lamps were evacuated by means of the mercury pump.

The pumps—of which there were an infinite variety—worked in somewhat this fashion: the receiver was joined to a barometric vacuum. The equalization of pressure would thus bring some of the air in the receiver into the barometric vacuum. The receiver was then cut off by an automatic mercury valve—usually a rising column of mercury—and a new vacuum was created. This cycle was repeated until the desired pressure was obtained or until the pump would produce no further decrease of pressure in the receiver. Some of these barometric pumps utilized the aspirator principle.

FROM this point on, begins the "Golden Age" of vacuum practice. For Gaede—one of the outstanding names in vacuum technique in the twentieth century—produced his *rotary* mercury pump, a high-vacuum pump of comparative simplicity, ease of operation, and great mechanical strength, in contrast to the fragile pumps of the Töpler and Sprengel variety. Different types of rotary pumps followed in fast and furious succession, Gaede, Holweck and others contributing continual improvements. Of these innumerable types, only one remains in common use today. This one embodies most of the previous variations.

In this, the rotary pump—essentially a refined, reversed version of the rotary pumps much used in modern refrigeration—a cylinder, mounted eccentrically on a shaft, rotates in a larger cylindrical space. Above the eccentric, parallel to the shaft, is a rectangular vane of metal held in close contact with the rotating eccentric all along its length by means of a spring. The larger hollow cylinder is connected to the atmosphere and to the system to be evacuated by two holes, one to either side of the vane, radially, and perpendicular to the axis of the rotating eccentric. The entire apparatus, extremely accurately machined, is immersed completely in a low vapor pressure oil. When the interior eccentric cylinder is revolved, it delivers the air from one side of the vane—this, in effect, divides the large hollow cylinder into two spaces—which is the side to be exhausted, to the other, the atmosphere. This pump is extremely efficient, fast, and creates a very good vacuum. The Ceuco Hyvac rotary oil pump—a very well-known instrument—will exhaust a vessel to a pressure of .1 microns of mercury (10^{-4} mm.).

Modern mass production of X-ray tubes, photoelectric cells, electron tubes and other devices requiring high vacua, is made possible, only by the utilization of the high-speed, low-pressure diffusion pump operating in conjunction with the rotary forepump described above.

From here on, the essential devices to be considered are the forementioned combination, the "getter" and the gauges used to measure low pressures.

IT WAS in 1915 that Gaede produced the first of the many diffusion pumps that were to follow. This pump is to all intents and purposes

vital to modern technology. Dr. S. Dushman of General Electric describes the principle of the Gaede diffusion pump in the following fashion:

"Imagine a tube through which steam is flowing. Connected to this steam line, perpendicular to the axis of flow, is another tube joined to a sealed reservoir, while at the junction of the tubes is a porous plug. Molecules of air in the sealed tube, by virtue of their individual kinetic energies, will tend to diffuse through the plug into the steam stream, from where they will be carried away by the flow of steam. Water vapor will, of course, diffuse from the steam stream, through the permeable plug into the tube and the bulb, where due to the temperature differential, it will condense and hence not enter into the system."

Substitute a steel slit of carefully calculated width, to allow for the mean free path of the molecules at low pressures, mercury vapor for steam, and liquid air for the air cooling of the junction tube—that was the original Gaede mercury diffusion pump.

This pump, while better than the others, required accurate adjustment of the steel slit and careful control of the temperature of the mercury vapor. Others, however, overcame these faults by different designs.

Dr. Irving Langmuir, after having done much research on the condensation, vaporization, and reflection of molecules from various surfaces during his study of the incandescent lamp, constructed a "condensation" pump. This, too, was in its essentials a diffusion pump, with the difference, that the critical adjustments of the jet through which the mercury vapor passed, and the precise control of the temperature of the mercury vapor, were eliminated,

Gaede, Langmuir, Payne, Dushman, Hickman and many others have contributed to the development of this pump, which in one form or another, employing mercury vapor or organic oils, and heated by gas or electricity, prepares the high vacua necessary to the successful operation of the thousand and one devices involving low pressures.

The mercury vapor diffusion pump, though still in use, seems to me, to be giving way to its complement, the oil diffusion pump.

C. R. Burch of the Metropolitan Vickers Electric Co. of England, discovered that certain high boiling-point petroleum derivatives could be successfully used as substitutes for mercury. This led to the development of the modern two-stage diffusion—oil—pump.

The principle upon which the oil diffusion pump functions is identical with that of the mercury vapor pump. Fortunately, however, certain advantages are realized by their use. With mercury diffusion pumps, in addition to glass, only steel may be used. More easily workable metals, such as aluminum and copper, may be used in the oil diffusion pump. The extremely low-vapor pressures of the oils used eliminate the liquid air traps necessary for very high vacua with mercury pumps. Furthermore, the oil diffusion pump is extremely rapid in action.

In this country Hickman of Eastman Kodak and Dushman of General Electric and their associates, have done much to improve these pumps not only from the laboratory technicians' standpoint, but also from a practical industrial view. Simplicity and efficiency are the key-notes of these high-speed, low-pressure oil diffusion pumps. Naturally, in industry fragile glass apparatus

is undesirable, wherefore these pumps are made of metal.

CONSIDER the evacuation of a small X-ray tube having a capacity of about one liter.

The spherical envelope has the usual two protruding arms of the ordinary Coolidge tube, into which have been sealed the tungsten filament—or cathode—and the target, also of refractory tungsten. The tube is exhausted through a half-centimeter glass lead-in. In connecting receivers to pumps, gauges and the like, for very high vacuum work, glass-to-glass seals are almost essential. But in some systems where this is impossible or where it is undesirable to do so due to the necessity of making frequent entry into the vacuum chamber—as in the aluminizing of mirrors—metal-to-metal, rubber-to-metal, rubber-to-glass, glass-to-metal and cemented seals are used. Since an X-ray tube requires an extremely low pressure or high degree of evacuation, all connections to it are of the fused glass-to-glass variety. It was formerly a common practice to use ground glass seals covered with mercury, but in modern high-vacuum technique such a connection is unsuitable.

The X-ray tube is first sealed to a gauge—of which more will be said later—and then to a liquid air trap. The trap, though not really necessary is desirable, as it practically prevents the slightest diffusion of oil molecules into the vacuum chamber. The trap simply consists of a section of the lead-in tube immersed in a container of liquid air or other refrigerant as solidified carbon dioxide. The trap is then connected directly to an oil diffusion pump which in turn is joined, first, to a gauge of the MacLeod type, and then to a reservoir. The gauge serves to read the

pressure on the "rough" or moderate pressure side of the system, while the reservoir acts as a trap to prevent any oil, which might accidentally back up from the rotary pump, from entering the high vacuum system. The reservoir then joins the rotary oil vacuum pump or forepump, as it is commonly known, which lowers the pressure in the whole system to a point where the oil diffusion pump may begin to operate. The system is then ready to function.

After it has been ascertained that all seals are gas-tight the rotary oil vacuum pump is started, being usually operated by a $\frac{1}{4}$ or $\frac{1}{3}$ horsepower electric motor. The pump is kept running until the pressure on the MacLeod gauge approximates .001 mm. of mercury at which point the oil diffusion pump will ordinarily "take hold." However, it is necessary to keep the forepump running during the entire evacuation as it literally throws out the molecules delivered to it by the oil diffusion pump. The oil diffusion pump is started by switching on a radiant electric heater beneath it and as soon as the oil vapor begins to stream through the jet, real *exhaustion* takes place. Since the oil at this low pressure gently but rapidly evaporates, rather than boils, there is not much agitation of the liquid in the boiler of the pump. Flowing through the neck of the pump and thence through the jet, the swift stream of oil molecules catches and carries with it any air molecules which have been so brash as to diffuse into the neighborhood of the jet, where it delivers them to within the rotary pump's reach, which in turn "kicks" them into the atmosphere. During this process the jet of moving oil particles impinges on the air—and often water

—cooled walls of the pump where it is condensed and returned to the boiler. All this, of course, is one continuous cyclic operation, never ceasing for an instant. The time of exhaustion depends on the sizes of the pumps used, and several other factors which we will consider shortly. The pressure in the X-ray tube, in any event has reached a fairly low figure. Still, it is too high to permit of the proper functioning of the tube. It is here where the bane of the vacuum technologist must be met and beaten.

ALL METALS and glasses, even in *vacuo*, have adhering to them in thin monomolecular layers, molecules of *adsorbed* gases which even the highest evacuation of which the physicist is capable, will not remove. In addition to that, most metals and glasses, unless especially treated, contain dissolved gases, which, too, must be removed. The removal of the latter type of gases is inherently not so difficult, provided it is possible to pass an electric current through the metallic elements of the tube. This method may be used in ordinary radio tubes where the electrodes are an integral part of the tube itself. Those metallic parts of a tube through which current cannot be passed, are heated by inserting the entire tube in a high-frequency electromagnetic field during the process of exhaustion. In the case of the X-ray tube this method will have to be resorted to, since the target of tungsten cannot be made part of an electric circuit, readily.

The gases adhering to the glass walls are generally removed by heating the glass almost to its softening point with a gas flame. Water vapor is particularly persistent in adhering to such walls and is extremely difficult to get rid of.

The X-ray tube of which we were speaking is then given this treatment. After exhaustion to a high degree, an induction furnace is placed around it, the while a gas flame plays on its walls. Tremendous volumes of gases, both occluded and adsorbed have been given up, and this becomes obvious by the sudden increase in pressure as recorded by the Pirani or ionization gauges which are connected to the "hard" vacuum side of the system. The diffusion pump continues to carry away these gases as fast as they are emitted, but it is impossible of course, to prevent generation of any of the residual gases that the above methods may have missed. Methods are provided for the removal of gases formed *after* the tube has been sealed. We will consider those later.

Assuming that the X-ray tube has been treated as above, the gauges will, after a time, indicate little or no residual pressure, depending on the sensitivity of the instruments. At this point, the very minimum pressure permissible would be of the order of 10^{-9} or 10^{-10} mm. of mercury. If this pressure is deemed adequate, the tube is sealed off, fitted with the proper contacts, and is ready for use.

Before proceeding with a discussion of gauges and "getters" let us consider what has been done to the volume of air within the tube. It had a capacity of 1 liter, which is to say that there were 2.7×10^{22} molecules of air present, or 2.7×10^{19} molecules per cubic centimeter; in ordinary notation 27,000,000,000,000,000,000 or twenty-seven quintillions of molecules to the cm.³ With the forepump, this astronomical figure was reduced by a factor of approximately 10^{-6} , leaving still 2.7×10^{13} molecules in 1 cm.³ of the rare-

fied air. Even though the pressure was reduced to one-millionth of its original value, there are still twenty-seven trillion molecules per cm.³ left. Then, using the oil diffusion pump it was reduced further by a factor of 10^{-6} leaving a final vacuum (?) containing almost 30,000,000 molecules per cm.³ Yet this vacuum is high enough to allow the X-ray tube to function properly, because the mean free path of the molecular motion has risen from 10^{-4} mm. to the dimensions of the tube. Electrons from the cathode will thus have a pretty clear path to the target, while the probability of collision with air molecules has been reduced to an insignificant figure.

Possibly the most accurate and certainly the most picturesque term in the nomenclature of vacuum technique, is the word "getter." Absorbed and adsorbed gases remain in, for example, the ordinary radio tube, even after the most prolonged heating. After the tube has been in use some time, they are gradually given off causing the vacuum in the tube to go "soft." It is then that the getters go in and *get* these in-fractionous molecules. In examining a radio tube, it will be noticed that the walls usually have a silvery deposit on them. That is the getter.

After exhaustion by the vacuum pump and during the end of the subsequent treatment in the induction furnace, a small pellet of magnesium, barium, or calcium, suspended in a small metal cup and supported by an element extension, is volatilized or "flushed." This gives rise to the mirrorlike film on the interior of the tube. Not only does the condensed film of metal remove the gases released at that time, but it continues to do so for the life of the tube. There are in use, any number of different types

of materials as getters, ranging from phosphorus to "mischmetal," but calcium and barium and magnesium are the best all-around getters. Phosphorus was used in early electric light manufacture as a "clean-up" agent.

ANOTHER METHOD of decreasing the pressure, is "aging by voltage" as it is colloquially known. Immediately after sealing-off the exhausted tube, a potential difference is set up between the cathode of the tube and its walls, while the cathode is heated electrically. Ions, formed by collision of air molecules with the cathode-emitted, high-speed electrons, are driven into the walls of the tube where they remain. Appreciable reductions of pressure have been obtained using this technique of degassing.

The measurement of low pressures is a highly developed technique in itself. Simple mercury manometers can be and are used to measure the comparatively high pressures of the order of 1/10 mm. of mercury—the limit to which readings of the mercury miniscus can be taken with any degree of accuracy even with the vernier and micrometric devices employed. The most commonly used mercury manometer at present is the MacLeod gauge.

In this instrument, a mercury "piston" compresses a volume of gas whose pressure is to be determined into a capillary tube, where utilization of Boyle's Law enables the pressure to be calculated. When the ratio of the gas compressed to the volume of the capillary is as large as possible, the sensitivity of the gauge approximates 10^{-6} mm. of mercury. Ordinarily, however, a sensitivity of about 10^{-4} mm. of mercury is sufficient since the gauge is used primarily to measure the pressure on

the "rough" side of the vacuum line. Various modifications of the gauge exist, but it is limited in its applications because it cannot be used for condensable gases nor for those gases which attack mercury.

A unique method for measuring low pressures was devised by Langmuir. A fine quartz fiber is fixed to a support in the vacuum chamber. The fiber is made to vibrate by a blow from a glass-incased, pivoted, bit of iron—this striker is manipulated by an external magnet. At moderately low pressures, the period of the oscillating fiber is proportional to the viscosity of the gas, and hence to the pressure. The gauge is infrequently used though, except for corrosive gases.

For most high vacuum measurements, electrical gauges of one kind or another are used.

Gauges of the Pirani type consist essentially of a filament in a glass envelope connected to the vacuum system by a glass tube. The filament is heated electrically, and since the heat conductivity of the gas is a function of the pressure, the electrical characteristics of the filament will be functions of the pressure also. Any one of the characteristics, such as the change of current at constant voltage, the change in wattage at constant resistance and hence constant temperature, the change in resistance at constant current, or the actual change in temperature of the filament, may be plotted as a function of the pressure.

A representative type of Pirani gauge has an envelope measuring about three inches long by one inch in diameter. Properly supported within the cylinder is a coiled tungsten filament of perhaps 1.8 ohms resistivity. At a potential of about 3 volts the filament draws approximately 1.6 amperes and is at a tem-

perature of 130° C. At fairly dense values of the gas, the filament will lose heat at a rapid rate and hence will have a lower resistance because of the lower temperature; it will thus draw more current. Conversely at less dense or viscous gas values, the filament temperature is somewhat higher—ergo, the resistance being higher, the current decreases. At low pressures, from about 100 microns of mercury down, the current varies linearly as the pressure. It is then simple to calibrate the microammeter to read directly in microns of mercury.

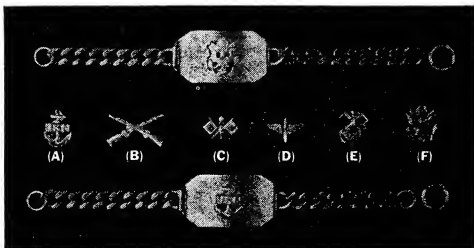
The Pirani gauge usually consists of duplicate tubes, the second of which is highly evacuated and permanently sealed. Series connected, the secondary tube serves to compensate for external temperature changes of the gas whose pressure is being measured. Pressures 10^{-7} mm. of mercury and lower can be measured satisfactorily.

As WITH most scientific instruments, many modifications of the Pirani gauge exist. The thermocouple gauge is the most interesting example. As in the Pirani gauge, an electrically heated filament is employed. In contact with this heated wire is a sensitive platinum-nichrome thermocouple, connected to a millivoltmeter. Variations in the temperature of the filament as the pressure changes cause differentials in the potential existing between the couple. As too, in this gauge, when the rate of this change is known, the millivoltmeter may be calibrated to read directly in microns or millimeters of mercury.

The most useful, all-around vacuum gauge, and the one capable of measuring the lowest attainable pressures, is the ionization gauge. This instrument is an adaptation of

the ordinary three-electrode vacuum tube. As a matter of fact, for pressures above 1 micron of mercury, a gauge may be constructed from—oh, say, a radio tube of the 12A type. The ionization gauge contains a tungsten filament—frequently of the thorium oxide impregnated type—a helical grid of tungsten, and a plate or “collector” of platinum or molybdenum. The filament draws 3 amperes at about 5 volts. Electrons literally boil off of it and are accelerated toward the grid and collector, the former of which is maintained at a potential of about plus 100 volts. Intervening molecules of gas, struck and ionized by this electronic bombardment, move toward the collector—minus 25 volts—strike it and give up their charge, i. e., collect electrons from the plate, thus causing a flow of current through the microammeter in series with the collector. Variations in gas density and consequently in pressure, affect the plate—high pressure, high current flow, and vice versa. To be exact, in one type of ionization gauge, the log of the plate or collector current varies linearly as the pressure. Where extreme sensitivity is desired, it is possible to rig up an electronic amplifying system.

MOTHER NATURE has done a good job of “abhorring a vacuum” because, even though physicists are able to remove 99.999999999 percent of the molecules from a given volume of space, there are still left more than 270,000 molecules per cubic centimeter of that space! This gives rise to the thought, “What is the limit of this process of removing molecules from space?” Through habit and from the lack of a better word the word “vacuum” is used in a relative sense. A vacuum, strictly speaking, means only one thing—ab-



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sence of matter. Therefore, in a literal sense, no such thing as a vacuum has ever been attained. Physicists have devoted much time and effort to reach the limit of vacuity. Yet, despite every artifice known to the physicist's knowing clan, from liquid air traps to charcoal adsorbers, a vacuum in the absolute sense is quite a way off.

The beginnings of radio back in the early '20s stimulated and gave impetus to vacuum technology. The necessity for producing millions of radio tubes at low cost, yet with fine characteristics, particularly with what had been hitherto regarded as extremely high vacua fit only for the research laboratory, set technicians to racking their brains for rapid, efficient pump designs. The mercury and oil diffusion pumps resulted.

While a great deal of research is being done on high vacua today, it seems that that last million-or-so molecules per cm.³ are going to have to wait for some time before they are dragged out. As yet there seem to be no radical innovations in vacuum pump design.

Aside from exhausting various electronic tubes, vacuum technology serves important uses in other fields.

In early experimentation on isotopes, vacuum or as it is now called, "molecular distillation" enabled scientists to isolate the isotopes of chlorine and mercury. Vacuum distillation permits of the isolation of the wanted materials, literally molecule by molecule. In the case of the above-mentioned isotopes, the word "evaporation" better explains the process. By virtue of their lesser atomic and molecular weights, unimpeded by air molecules above them, the isotopes were free to make their way to a separate container where they were condensed. Iso-

topic separation, however, is of lesser import than some of the present-day uses of vacuum distillation.

In obtaining vitamin concentrates from fish oils, vacuum distillation plays an important role. The easily decomposed vitamin-bearing oils are placed *in vacuo* in a still of complex design, where by the very gentlest application of heat, they are distilled into a receiver. Fractionating stills are used, because by repeated distillations an almost pure concentrate may be obtained.

In the more prosaic task of sugar refining, the comparatively low vacua required are supplied by steam aspirators, or similar "suction" devices. The aspirator is quite commonly found in industry where high vacua are not necessary. It is essentially an application of the Venturi tube. When a fluid passes through a tube, along the length of which is a constriction, the pressure of the fluid against the walls of the constriction is less than that against the tube walls. Therefore, when a suitable tap is made at the constriction the material in the tap will be "sucked" into the Venturi tube proper. The common water aspirator of the chemical laboratory as well as those of industry utilize this principle. The aspirator is not to be confused with the diffusion pump since there is a definite difference in their respective principles. The aspirator principle has been successfully applied, though, to the oil diffusion pump, in order to eliminate the necessity of using a forepump. The aspirator, using a stream of oil or mercury vapor as a base, lowers the pressure in the receiver until the diffusion jets will take hold.

Metallurgists have been and are experimenting with vacuum fusion. As has been said, metals as ordinarily cast in air contain surprising

quantities of dissolved gases. Naturally this has the effect of weakening the metal though it is negligible and insignificant in the case of the usual large-scale casting, forging, rolling, drawing and other metal operations.

But where the metals are to be used *in vacuo* or where they require extreme strength, it is a different story. Consider refractory tungsten. Due to the difficulty of fusing tungsten, it is treated by the new powder metallurgy method. It is obvious that by this technique, even after allowing for the effects produced by drawing it into wire, the tungsten will contain large quantities of gases. These are removed by heating, almost to the fusing point, of the metal, *in vacuo*. Such treatment is also accorded nickel, molybdenum, and other metals designed for use in vacuum operation.

Unquestionably, modern vacuum technique is good. It remains to be seen whether it can be made better and whether the necessity for so doing will arise. Physicists are not so far away from equaling the vacuity of outer space. Considering Richardson's figures on the density of interstellar space—of the order of tens of millions of atoms per cubic meter—we conclude that man's efforts in making vacua—of the order of trillions of atoms per cubic meter—are not to be despised.

IT IS UNFORTUNATE that the human mind is incapable of visualizing these huge numbers of which we so glibly speak. It is thus more difficult for one to *appreciate* the magnitude of the quantities dealt with. It is true, though, as Dr. E. E. Smith says: "It is *enough* for one to be able to handle and utilize gigantic numerical quantities even without

appreciating or realizing their inconceivable magnitude"—or words to that effect.

All through *this* article, and any article on atomic or molecular physics are placed large numbers—billions, trillions, quadrillions, et cetera. The mathematics used to handle such numbers is essentially a shorthand arithmetic—denary system, a method of placing—as all counting is—molecules into a one-to-one correspondence with certain ink strokes on paper; yet not one iota of meaning is given such stupendous numbers of molecules in even so small a volume as one cm^3 . Perhaps by coordinating duration with quantity, a clearer picture of what a quintillion or sextillion is, may be seen.

A common problem in elementary college physics is this: (taken from Saunder's "Survey of Physics")—Assume that there is a small leak in a perfectly evacuated incandescent lamp bulb. Through this leak, there flows into the bulb, one million molecules per second. How long will it take before the bulb is filled with air at atmospheric pressure?

Now, unbelievable as it may seem, three quintillions of seconds, or about ninety millions of years will elapse between the entry of the first and last molecules! Consideration of that ninety millions of years, even though abstract in itself, seems to give a little more meaning to the tremendous numbers of molecules in only a small volume—about one hundred cubic centimeters.

But, to repeat, abstract or not, we are capable of dealing with insuperable quantities, and though the human mind may not appreciate the Gargantuan figures, we still are able to use those vast numbers so long as they enter into our construction of vacuum tubes.

THE END.

SEAT OF OBLIVION

By Eric Frank Russell

He'd found the crook's ideal of the absolutely perfect hide-out—a way to hide in another man's body!

Illustrated by Orban

NEITHER of the pair knew that Jensen was behind that door. If for a single instant they had suspected that an interloper was there, stretching his eager ears in the darkness outside, they'd have been more cautious in the matter of shooting off their mouths. But they didn't suspect—Jensen was too shadowy and soft-footed to betray himself by as much as the sigh of a deeply drawn breath. So the two talked on, or rather argued, their voices loud with the loudness of contradictory and irreconcilable opinions.

In the deep gloom of the passage Jensen stood with his ear near to the inch-wide crack of light flowing past the almost closed door. His hearing was directed toward that crack, but his hot, hard and somewhat bloodshot eyes kept watch in the direction whence he had come. There was silence in all the rest of the house, but he was taking no chances on the sudden appearance of a servant as cat-footed as himself.

He must not be caught. In no circumstances must he be captured again. The stir-crazy Hammel had bumped one guard as they made the jailbreak, and although he, Jensen, had not fired the shot he was implicated both before and after the fact.

Not that another killing made much difference—he'd practically ducked from under the chair as it was. But Jensen wasn't going to the chair. He had brains in his dome, and guys with brains in their domes don't go to the chair.

The death house stare was still within those eyes that continued to flicker warily while he listened. There was a fat, middle-aged man in that room. He was debating with a little, white-haired runt who looked more like a country horse doctor than anything else. The subject of the argument was a machine.

Fatty's name was Blenkinsop, and he addressed the other sometimes as Wane, sometimes as Dr. Wane. The machine, of which Jensen had managed to catch a glimpse through the crack, was a highly polished and rather complicated affair bearing a slight resemblance to those big helmets under which dames sit and get their permanents. It was fitted on a high-backed chair, and a long cable connected it with the electric mains.

"All right, Wane," oozed Blenkinsop, "I'll accept your statement that original life force is an all-pervading radiation that you have captured and controlled. I'll also accept your claim that this gadget can spray this



*For a moment the personalities struggled for possession—
then, backed by the power of the machine, he was in!*

same life force as easily and as simply as a sunray lamp can spray healthful rays." He patted his very large stomach, sucked his cigar until his fat cheeks went hollow. "So what?"

"I've told you repeatedly," replied Dr. Wane. "The immense growth of spiritual strength permits liberation of the psyche."

"Yes, yes, I know." Blenkinsop burned half an inch with one suck. He blew the product over the machine. "I've read of that stunt being done by mystics; ramas and khamas and llamas and swamis and all those nuts. I once knew one named Raj Swami Alajar. He claimed he could release his astral body and go places. He was Joe O'Hanlon from

Minneapolis, and it was bunk!" He made four chins with his grin. "But with a machine produced by a qualified scientist like yourself, I will not deny that it might be possible."

"It is possible," asserted Dr. Wane, with sudden violence.

"KEEP calm," Blenkinsop advised. "I will grant your claim without test." He waved a fat hand airily; a diamond on the middle finger scintillated brilliantly, drew an answering gleam from an eye near the crack in the door. "I'm your backer," said Blenkinsop, expansively. "I'm just a plain, honest, hard-working and thoroughly deserving financier. Knowing this, you will appreciate that there may be a difference in the way we view things."

"Don't mention it," said Wane. "We've had dealings before."

"To our mutual advantage," the other pointed out. "Now me, I look at this new thing of yours, and I say to myself, 'Here's Wane's latest brainwave. It does what he claims. It cost me money. Can it show me a modest return for my outlay?'" He moved his gaze from the machine back to Wane. "Well, can it?"

"Money, money, money," voiced the little doctor, sarcastically. "Is accomplishment to be judged only by the standard of what profits can be dragged in?" He pointed to the machine. "I've said that it'll liberate the psyche of any subject."

"Who wants to liberate his psyche? Who'll pay to have it done? Hell, pigs can fly nowadays, so what's the use of an automatic psyche liberator? If I go to see Maisie in Santa Monica, I go in person, flesh, blood, clothes and all. Where'd be the sense in just sending her my astral body?"

"You forget," retorted Wane, his voice rising once more, "that the gain

in life power is such that the affected personality can escape and take over any other living body it desires, ejecting the natural owner forever—excepting, of course, any case where the owner happens to have received treatment giving him power equal or greater."

"Body-snatching," grinned Blenkinsop. "You've produced some wonderful things in your time, but this time you've slipped up. I can't get dividends out of a mechanical body-snatcher, and I'm not interested in the thing."

"You go off at angles," protested Wane. "I only contemplate the legal transfer of bodies."

"Legal!" Blenkinsop choked as he tried to laugh with a chestful of cigar smoke. "Whose bodies can be taken legally, and for whose benefit?" He stabbed Wane's middle with a thick finger. "Who's going to pay for the transfer, who's going to get the money, and where do I come in?"

Looking him over with open distaste, Wane said, "Last Thursday, Collister died. He was the world's leading cancer specialist. The same day, they executed Bats Maloney, a criminal. Collister's personality was vigorous and healthy to the last, but he was physically worn out by a lifetime of service to humanity. Bats Maloney died as an incurably warped and antisocial psyche inhabiting a coarse but thoroughly healthy body."

"I get it," said Blenkinsop. He picked up his hat. "You'd have liked to shove Collister inside Maloney's carcass. I won't argue about the scientific aspect, because I believe you could have done it, but I know my legal oats. I haven't spent my life in a laboratory; I've spent it in this wide and naughty world. Take some advice from a miserable sinner: you won't get legislation to

cover a trick like that if you agitate for it from now until the crack of doom."

"But—"

"Be your age," Blenkinsop ordered, displaying loss of patience. "You're too idealistic. I can't sell an ideal for ten cents, let alone a million dollars." The eye behind the door gleamed and vanished even as his fat hand reached for the door handle. "I suggest you get going on that stereoscopic television you've been thinking about for years. There's money in that. The public wants it. But if you offer me another crazy dingus like this one, I'll die laughing."

Then he went out laughing—and died.

JENSEN said to Wane, "You're a brainy old geezer, and there ain't much of you, but you've got some funny ideas." He let his gaze roam over the other, noted that the eyes, though tired, were sharp, full of inward fires. This white-haired runt had a toughness of his own, a sort of mental toughness that he could both sense and respect. Wane would never break free by violence or so much as dream of attempting it. He'd just stay put, thinking, thinking. Then one day Jensen would find himself outwitted and in the bad.

"For your own good as well as mine," Jensen warned him, "there are some facts of life you ought to know. The first is, I busted out of the death house last night. I'm only half a jump ahead of the cops, but I ain't never going back." A hard stare at his listener. "Never!"

"I knew you were a fugitive," said Wane, easily. His eyes roamed from his tightly bound wrists toward the gleaming machine and thence to the other's harsh features. "Your photo

was in this morning's papers along with three others."

"Yes, there was me, Hammel, Joule and Krast. We split up. If I never see them again, it'll be too soon."

"You were described as Henry Meynell Jensen," Wane proceeded. "A very dangerous man, wanted for double murder."

"It's triple now—I bumped the Fat Boy."

"Ah, Blenkinsop—you've killed him?"

"He was a blab—I closed his trap."

Wane looked slightly dazed, was silent awhile, then said, "Undoubtedly, you will be punished for that."

"Hah!" said Jensen, skeptically. He leaned forward. "Listen, Pop, or Professor, or whatever you like to be called: I've heard all about this dingus of yours. Fatty was no fool, and he was ready to believe that it really works. I could tell that you knew it would work. That's fine! That's real dandy! You're going to be my fairy godmother."

"In what way?"

"You're going to help me get myself a new body."

"I shall," said Wane, "see you in hell first!"

"Now don't get hard. You ain't in too good a position for getting hard, anyway." Jensen studied the other's bonds, bent and fingered the rope that held his victim's legs to the chair. "What they're after is my body. They want to put it in a chair and burn it. They'll know it when they see it because it's got a face, and fingerprints and other identifiable trimmings. You're the one guy in the world who can let them have what they want, and let me have what I want, and leave everybody pleased and happy. And all

I want is a body in which the cops ain't interested."

"I can do it," agreed Wane, "but I won't. I'm an old man, not afraid to die. You can add another crime to the burden already on your conscience—if you've got one—but it'll do you no good."

"Listen, dad," said Jensen, his face not changing, but his eyes growing icy, "you can act stubborn if you like, but it won't faze me. I was once a fully qualified electrician, and I'll deserve to fry if I can't get the hang of this gadget of yours with a little co-operation from elsewhere."

"What d'you mean?"

"I'll grab a kid and try it out on him. If it works properly, O. K.! If it doesn't, well, there's plenty more guinea pigs playing around the city lots. Maybe it'll take two, maybe it'll take ten, but I'll get there in the end. So it's your life against theirs."

"You wouldn't dare!"

"Nope? Let me tell you, little man, I'd dare anything that'd pull a stunt like this! Seems like you've never had only your brains and your legs to prevent your being short-circuited out of existence. A guy like me ain't going to let them do a thing like that. And a guy like me ain't going to spend all his life on the lam. You bet there's nothing I wouldn't dare to get rid of John Law for good and all!"

WANE thought it over, his steady gaze resting contemplatively on the other. This machine of his had never been tried on a human subject, but he knew that it would work, knew it as certainly as any scientist knows that a particular array of circumstances must produce a particular result. He shuddered at the thought of trying it out at the behest of this cold-blooded criminal. But

seeming agreement would gain him time. On the other hand, a blank refusal most certainly would profit him nothing, and might cost half a dozen innocent lives.

"I'll help you," he decided, "as far as I'm compelled to, and as far as my conscience will permit."

"That's plain horse sense," approved Jensen. He stood up, towering over the bound and seated figure. "Play with me and I'll play with you—but Heaven help you if you try to pull a fast one." He favored Wane with a cold, ferocious stare. "You've an auto in your garage. We'll take it. We'll take your machine with us. You and me'll set it up in a nice, quiet place I know, and when it's got me into the clear I'll smash it up and let you go."

His listener offered no comment, so he carried on, "I snitched these hick duds from a farmhouse, and I guess I could do with something more natty." His laugh was harsh and ghoulish. "But why bother looking for some when the new body will have its clothes already on?"

Still Wane made no remark. He sat there, his legs tight against the legs of the chair, his bound wrists resting in his lap. Unwaveringly, his eyes studied Jensen while his white hair gleamed in the artificial light.

Mooching to the silent machine, Jensen looked at the chair on which it was mounted, and said, "Reminds me of something other guys have sat in. Hah, that's a joke! I'll use the seat of the mighty to escape the seat of oblivion." He was astounded by the superbness of his own metaphors, aired them a second time, then repeated, "That's a joke!" Turning to the unmoving Wane, he added, "Where's your notes?"

"In the top drawer." Wane nod-

ded toward a tall, steel filing cabinet.

Getting them out, Jensen skimmed through them rapidly. His brief comments showed him to have a lot more intelligence than Wane had suspected, and he betrayed a surprising grasp of scientific terms and theories. Finally, he shoved the notes into his pocket.

"O. K., let's go."

THE HOUSE was a large, solidly built affair made offensive by years of neglect. It stood on a crossroads, in a commanding position, but its architectural importance had faded with the years. A big, dull ghost of a house; a place past which people hurried and at which only an occasional furtive figure knocked.

The sole occupant of this senile edifice was a blowzy person with an enormous bosom and piggish eyes. Wane recalled that when they'd appeared two days ago, this woman had received Jensen with grim resentment. Evidently the dump was a regular hide-out. Pig-eyes knew how to hold her tongue, she needed the business, she didn't like the risks.

Standing in the shadow by an open window on the sunless side of the house, his attention fixed on the crossroads, and Wane's notes held loosely in his hand, Jensen said, "I guess I've got it all now. I can't trespass on a different species, meaning animals and suchlike." He grinned. "Who'd want to be an animal, anyway?" He glanced at the notes, returned his gaze to the outside. "If I make a change, I've got to make it fast, because I don't retain the increased power—it dissipates itself in a couple of minutes, bringing me back to normal. That right?"

"Yes," said Wane, reluctantly.

"Which means I can't jump from

one guy to another, huh? I'd have to get myself recharged each time I wanted to make a change. Ah, well, one'll do for what I want. I'll pick on the first specimen that suits my fancy."

"Look here, Jensen, can't you drop this dangerous trick and—"

"Shut up!" Jensen again refreshed himself with the notes. "All I have to do is concentrate my gaze on the gimp I'm going to take. Directly I find myself free I jump him and beat him out of his own carcass." He whirled around. "Say, if I kick him out, is there any chance of him taking over my body when I've got his?"

"None whatever," said Wane, flatly. "Only a living body can be taken over. A dead one is impossible to occupy." He didn't offer any reason, and Jensen did not ask for one.

The criminal's entire attention was now fixed on one of the roads. With powerful binoculars to his eyes, he was making a close study of his subject. His general attitude was one of strained excitement. Suddenly, he dropped the glasses, made for the chair over which they had fixed the life force projector.

"Here he comes! Just the guy I want!" Sitting back, he exposed his teeth. "Put on the fluence, and be sharp about it!"

Obediently, though sick at heart, Dr. Wane socketed the power plug, moved the switch. There was nothing else he could do. The desperate Jensen would be conscious and in full possession of his faculties right up to the very moment of release, after which—action would come too late. There was nothing to do but obey and pray for a failure at Jensen's cost.

His face paler than usual, he did pray silently for the utter and com-

plete failure of his life force projector, his mind sadly forming the words even as the apparatus sprang into operation. There was no light radiating from the complicated head-piece, no visible emanations to indicate that the device was functioning, but he knew that it now should be pouring its output into the eager, wolfish figure beneath.

Motionless in the chair, Jensen sat with his eyes bulging toward the open window; the look in them slowly grew to a hypnotic glare. For half a minute he squatted with that feral light flaring from his distorted optics while the fingers of his hungry hands twisted in nervous spasms.

Then with eerie suddenness his face fell into repose, his hands quietened, the light died from his eyes.

Wane stared at the limp thing in the seat. Incredulity, hope and fear alternated through his mind, while his ears failed to note that the walker in the roadway had turned into the path, stamped hard-heeled up the steps, and even now was knocking upon the front door. He was still staring as Pig-eyes slopped along the passage and opened the door with a bellicose, "Well?"

A rumble of short conversation sounded from the front while Wane gazed at the form he knew to be a corpse, passed weary hands through white locks, and realized that his frantic prayer had not been answered. His machine worked!

With trembling fingers, he switched it off, turned to face the newcomer. The figure entering the room was that of a man some years younger than Jensen had been, also broader in the shoulder, heavier in the jaw, easier in carriage. He was wearing pepper-and-salt whipeords of expensive cut, a genuine velours slouch-brim hat, and handmade

brogues of mellow sheen.

"Well," said this person, his voice deeper than Jensen's. "How d'you like me?" Spreading his arms, he revolved slowly, like a manikin displaying an evening gown.

"You're . . . you're—not Jensen?"

"Sure! Sir Henry, that's me!" Blithely stepping to the chair beneath the machine, he looked at the figure flopped therein. The satisfied expression fled from his face and was replaced by a look of awe. "Say, it's a hell of a feeling to see yourself dead! It gives me the creeps all through my insides."

"What was the change-over like?" asked Wane, speaking with an effort.

"I dunno. It made me feel like I was doing a job that nobody'd do unless he was as close to the hot seat as me. I got bigger and bigger, and stronger and stronger. Then all of sudden there was a sort of ghastly snap and I was out of myself and inside him. Yeah, right inside, walking on his legs, seeing through his eyes, hearing through his ears, and fighting him for his brain. He struggled like a maniac before I tossed him out." The new Jensen had sobered himself by his own recital. He shuddered. "I seemed to hear his wail as he went—it was awful!"

"That," declared Wane, deliberately, "was a murder. You'll answer for it in a court higher than any in this country." A strange look was on his lined features as he continued to examine the dapper personage who, almost unbelievably, was Jensen. "And I share the guilt."

"Forget it," advised the other. He had another uneasy stare at the body he once had owned. "I can't take this back any time?"

"Never. It is dead. You can't reclaim a dead body. In fact, you can only occupy a living one by tak-

ing command before or instantaneously with its rightful owner's release. It's like changing drivers in a speeding car; the feat is risky, but it can be accomplished providing that one steady hand remains always on the wheel. There must be continual control by one or the other."

"I get you. He staggered around a bit before I pushed him out. Guess the car was skidding, huh?" A thought struck him; he scowled to himself. "Now he's gone, where's he gone?"

"The whole world would like to know," Wane told him. "That question voices the mystery of life."

"All right, all right. Guess you can't be expected to know everything." Pulling a thin dress watch from his pocket, Jensen consulted it admiringly. "I'm going to dump my body where the cops'll find it and call off the heat. It'll carry evidence solving the Fat Boy's murder for them, ha, ha, ha! I'm starting my new life by doing the cops a good turn. Ain't that a joke?" His eyes turned to Wane. "I'm going to keep your gadget and your notes. I'll let you loose on my way to some place else."

"You're going to release me?"

"Of course! Why not—I'm a reformed character, ain't I? Blab if you like. See if you're believed!" His laugh was loud, triumphant. "Even if you do tell them the whole story, and make them believe it, where'll they go from there? Describe me to them. Take a photograph of me and give it to them. Give them my pawprints with it. They won't know who I'll be tomorrow, or who else I'll be the day after that!"

"But you said you'd smash the projector."

"You bet! Kill the goose, eh?" Buttoning his jacket, he swaggered

around. "I can go where I like, do what I like, let any witness positively identify me, and not give a single damn. Before the cops can catch up, I'll be some other guy." His laugh verged on the uproarious. "I might help them look for myself. I could be the chief of police—or even the President of the United States!"

Wane's mind went icy cold as he realized the full truth of the other's boastful remarks. Here was something well-nigh invincible for the forces of law and order to struggle against in vain, something that he, Wane, unwittingly had presented to the field of crime. No doubt the ambitious Jensen would keep the secret of his own power entirely to himself, jealously hiding it from others of his lawless world. But he remained a fearful menace as an individual, or as a possible one of any thousand elusive individuals.

The subject was still writhing within the depths of his mind a good ten hours later. He got out of the car, stood on the grass verge of the lonely byway, watched the still dapper and openly gloating Jensen speed away into complete and unbreakable freedom. The car was gone with a trail of dust and a whir of tires. Wane watched it shrink in the distance, while a boastful phrase kept circling around in his brain.

"I can be the chief of police, or—" Despondently, the little scientist commenced to trudge toward the nearest town. "He can be anybody," he muttered to himself. "Anybody."

He kept on repeating the word until it became dismally monotonous. Then, just for variation, he said, "Somebody." It stopped him in his tracks. He looked at the far horizon, then at the sky, dazedly added, "Somebody—by hokey, that's an idea! Somebody!"

DURING his twenty years of hectic and lawless experience Henry Meynell Jensen had cased many a joint and subsequently heisted a goodly proportion of same. Which, in underworld jargon, meant that he was slick in pulling a job. He was an old hand in a young body, knew the most effective methods, was automatically responsive to all the necessary motions.

He was crediting himself with all this aptitude even as he strolled toward the little bank. This hick joint was a pushover that might have been made for a lone wolf. All he had to do was to use a gun and a soul like granite, both of which he possessed. What made the feat a pleasure and a joy were the unique touches with which he was now able to decorate the coming performance.

For instance, there was to be no spectacular getaway, no movie stunt of racing the law halfway into the next State. Neither need he indulge in so melodramatic a mannerism as wearing a mask. He'd walk in, take it, walk out, and dump it—just like that.

Which is precisely what he did do. He walked in half a minute before closing time, noted the place was empty of its few clients, showed the paying teller the hole in the end of what he'd pulled from his pocket. The paying teller looked both startled and incredulous.

"Don't yawp, brother. This is just a local boy making good." He edged his weapon slightly nearer, found himself wondering whether his face could look as tough and desperate as the face he used to have. "Wrap it up and I'll take it with me. I'll come again if I like your service."

Like one in a dream, the teller shoved bundles of notes together. There wasn't a lot; Jensen hadn't expected a big haul in this two-man

dump. But it was an easy break, and it'd keep him going until he got settled. Backing a step, he almost booted the panel out of the door to the manager's office. That worthy emerged under full steam, looked down the barrel, closed his mouth and elevated his hands.

Two minutes later, Jensen came out, carefully shutting the main door behind him. The pair were locked in the manager's office, but not bound. They couldn't use the phone—he'd seen to that. It would take them perhaps a full five minutes to break out. Five minutes were plenty for his purpose.

Unhurriedly, he clambered into his automobile, drove for two minutes, cached his loot in the luggage compartment of another parked automobile. Then he went to his one-room apartment, carefully seated himself by the open window, waited awhile. The helmet of the Wane projector hung over his head, the switch lay within his reach. His eyes were on the street.

The hue and cry had already started when he put out his hand and turned the switch.

HE GOT the projector away all right. That, above all, was the most important thing. The precious device must be given first consideration and preserved at all costs. Nothing must cause him to lose it, and if ever he had to take his choice between surrendering that or the loot, then the loot must go west.

After this, it amused him to walk casually along the street, his hands in his rough, homespun pockets, his lips pursed in a silent whistle. Funny the way he felt: sort of happy and horrified at one and the same time. Here he was, on top of the world—but with that terrible wail still ringing in his ears.

An excited group had gathered on the corner, their mouths working with staccato babblings: "Yeah, yeah, I remember when— Reminds me of Billy the Kid, except that he— As cool as you like. Just stepped in and helped himself— Second in six months. Reckon they ought to rebuild it and get themselves a guard."

"What's the matter, boys?" asked Jensen, amiably.

"Holdup," replied one lanky individual. His voice was curt, his stare slow and deliberate. "We got into town just in time to miss it. There was only one guy. He got away."

"Ah!" Jensen studied the out-of-towner with equal coolness. He scratched his head, tilting his hat over his nose to do it. "There's a big, green sedan parked outside the brownstone around the corner."

"Waal?" encouraged the other.

"Remember noticing it standing outside the bank for best part of an hour." His gaze was as level as the one his listener put on him. "Maybe its owner noticed something that'd help. Somebody ought to ask him—he mightn't yet know there's been a stick-up."

"Guess that's a useful idea," the lanky one agreed. "Bill's a deputy." He looked at his companions. They nodded. "Coming?" he said to Jensen.

"No, I've got to get along. You can't mistake the car; it's the big, green sedan outside the brownstone." He moved off, conscious that they were watching him. A hundred yards farther on he glanced around, found that they had vanished in pursuit of the sedan.

The rest was easy to imagine. They'd knock, ask his former landlady if the car's owner was in. She'd show them up to his room, or maybe she'd go up by herself. Anyway,

they'd find the body of the bank robber. The paying teller and the manager would identify it positively. But they'd never get the spoils.

Chuckling to himself, he returned to the other parked car, climbed into the driver's seat. The cash was back of him locked in the trunk. The projector lay hidden in its large carrying case on the rear seat. As for the car itself, he'd noted it for sale, posted the necessary money, requested the seller to leave it for him there to pick up at his convenience. The seller had never seen him in either this body or the former one.

Yes, this was the perfect crime. He'd got away with it and was absolutely in the clear. Moreover, he could do it again and again and again. John Law would run round in circles and get nowhere.

The only snag was that he didn't know whose body he was wearing. Regardless of his form, he was always Jensen, with no memories but those of Jensen. The evicted personality left him the brain, but never its private contents. Seemed as if memory was a spiritual faculty rather than a material record in the cerebellum. Scientists would be interested in that fact.

He felt around in the pockets of his jacket, looking for papers that would provide data on who he was supposed to be. He'd get the low-down on his new self before he started the car and beat it.

"Say, Hank, where'd ya borrow the heap?"

The sudden voice at his side startled him. A long, horsy, phlegmatic face stared at him through an open window. Its owner's jaws moved rhythmically on a wad of tobacco as he waited for a reply.

So he was Hank Somebody-or-other! Jensen's mind moved fast. If he fell in with the spirit of the

occasion, he'd surely trip up. Denial was the safest course.

It wasn't so flexible, this face of his, but he did his best to give it a slight distortion as he turned it toward the other and replied, "It's my own car. And I ain't Hank."

"What!" The long jaw stopped abruptly on the upstroke, and the mouth hung half open. "You ain't Hank?"

"No. You've made a mistake." He looked the surprised one straight in the eye. "I'd sure like to meet this Hank sometime. We must be twins. You're about the tenth who's mistaken me for him." Then a brilliant thought struck him; he favored his listener with a knowing leer. "Maybe there's a reason for the likeness—if only we knew it!"

With that, he started his machine, tooled her away from the curb. Horse-face watched him depart, his mouth still half closed on the chew.

This was the one flaw in the body-snatching racket. The odds were always in favor of picking on a local character and being involved in complications. In future, Jensen decided, he'd better study his intended victims as thoroughly as his jobs. Strangers to the locality would be his best bet any time, any place. Strangers to the country would be even better. But the flaw was there; he'd have to bear it in mind—and watch his step.

JENSEN always got a great kick out of reading the daily papers. He liked the touch of mystery, starkness and drama these journalistic guys put into their descriptions of unusual crimes.

Here they were, at it again, busy on his sixth successful exploit. According to them, the individual who'd pulled this last bank robbery single-handed was a person of al-

most saintlike disposition, with a lily-white record to suit. He'd been found dead. His takings had not been found. The unsolvable mystery was why a person so clean and upright had suddenly committed so desperate a crime. Also, why he had died, and where he had dumped the proceeds of his feat.

"Hah!" chortled Jensen, his eye crawling down the column of print.

All the same, these journalists could show traces of shrewdness. The writer of this particular report, a guy using the initials A. K. D., had linked this crime with three others. He enlarged on their common factors: bank robberies employing the same technique, done by people of unimpeachable character who, only shortly after, were all found dead—sans loot. Concluding, he recalled the official destruction of a local plot of marijuana, hinted darkly at the insidious spread of the drug traffic in outwardly innocent circles.

"Ain't that a joke?" Jensen asked of himself. Then his pleased eye side-slipped and found the advertisement.

It was a small one in the personal column, but given a little prominence by being boxed. He read it slowly:

H. M. J. Get in touch with me. Am willing to buy device for cash. Genuine offer. WANE.

Phoning the newspaper from a public booth, Jensen got Wane's address. It was out of town, but listed in the telephone directory. He used another phone a mile from the first.

"This is you-know-who," he announced, bluntly. "I ain't taking any chances with you, so talk fast before I hang up."

"Listen, Jensen," came Wane's reedy voice, speaking rapidly. "I've found a foreign backer who believes that the machine could be put to a

worthy purpose in his own country. He's willing to buy it."

"O. K., build him another."

"I've got to produce before I see his money, and I can't afford to do that. Besides, it would take me two years. Jensen, he's a young and extremely wealthy—"

"I'll think it over," interrupted Jensen. He rang off without giving Wane time to finish.

TWENTY-FOUR hours later Jensen had decided to dicker. It was to his advantage. His present body was one of absolutely no interest to the law, he was well plastered with the proceeds of his nefarious exploits, but he was perfectly willing to see whether more money could be extracted from the little scientist—without surrendering the projector. Also, he had another bright idea coming up. A really good one, this time.

Phoning, he made himself known, heard Wane say, "Well, how much d'you want for it?"

"How much," countered Jensen, "is this boob willing to pay?"

"I don't know. If you're willing to sell, you'll have to start somewhere. Name a figure as a basis. For all I know, he might meet it without argument."

The scientist's complete confidence in his backer's spending power got the better of Jensen's curiosity, and the latter said, "Who is this backer, anyway?"

"He's a European of thirty," answered Wane, his voice taking on an eager note. "He's a very, very wealthy man. He's engaged, and shortly to be married. I believe that his fiancée is also wealthy as well as one of the season's leading beauties. I can't reveal his identity at this stage, but I can tell you that he's got more money and influence than any man I've ever met."

"O. K., I'll talk to him."

"But—"

"No funny business," Jensen put

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State of New York, County of New York (ss.)

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared H. W. Ralston, who, having been duly sworn according to law, deposes and says that he is Vice President of Street & Smith Publications, Inc., publishers of Astounding Science-Fiction, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

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in, his tone harsh. "I'm ringing off. Sometime I'll phone you again and tell if I'm ready to talk to him. You can arrange a meeting in some nice, quiet dump. And you can tell him that the price'll be high!" He grinned as he hung up. A foreigner, rolling in dough, engaged to a society stunner. This was going to be good!

THE SET-UP proved that it was going to be good. The window of the opposite apartment was only fifty yards away, directly across the street. It was on the third floor, and Jensen could look right into it from his window on the same level.

Of course, the place could be a trap, but the way he was walking into it would make it a farce. Wane's tale about his wealthy backer could be a phony yarn. On the other hand, it might be genuine. Either way, he, Jensen, had much to gain and little to lose.

Yes, the gamble was simply one of whether, in abandoning his present body, he'd get the brawny carcass of some smart detective waiting to plug him on sight, or the patrician form of a foreigner who had it all.

Verily, Jensen had brains. Guys with brains don't go to the chair. He even had wit enough to anticipate that Wane himself might have a share of brains and guess how Jensen would try to spring the trap. Wane might, for instance, have been cunning enough to bait the place with a dummy or a corpse, enticing Jensen to release his psyche, leaving him frantic and disembodied to face real and ultimate death as his power dissipated. It's brainy not to underestimate your opponent, and Jensen wasn't going to be guilty of that.

So for some minutes he'd studied as much as he could see of the apartment through powerful binoculars. The guy hanging around behind that

open window was real and living. He'd gone to the window several times, peering cautiously down into the street, giving Jensen an excellent view of his face and figure.

This intended victim was youthful, burly and decidedly dapper. He was expensively jeweled, too. The diamond on his right hand was a veritable blinder. His carefully slicked hair and tough-looking face were slightly familiar. Probably Jensen had seen his pic sometime, perhaps in the society column arm in arm with a classy dame, or maybe with his foot on a dead tiger.

Anyway, his general appearance was quite to Jensen's taste. Picking bodies was like choosing overcoats, and the chooser was beginning to get somewhat fastidious. This one opposite would be entirely satisfactory for Jensen to wear.

Vaguely, he wondered whether the victim had a butler who would address him as, "Yes, milord!" and "No, milord!" Which reminded him, he'd have to drop his habit of saying, "Naw, it ain't." He'd have to practice saying, in high-falutin' tones, "No, Simmonds, it is not."

Slick-hair was now back at the window, having a careful look at an automobile which had parked by the curb below. He turned and spoke briefly to someone hidden in the farther shadows of the room, then brought his attention back to the street.

Jensen had an equally cautious look, let his gaze pass the silent vehicle, wander along the sidewalk, discover the slight figure and silvery hair of Wane as the little scientist trotted along with a nonchalant air. Without any hesitation or so much as a brief glance around, Wane turned into the doorway immediately below Slick-hair's post. The

latter was still studying the motionless automobile.

Now was the time. Diving for the chair, Jensen sat in it, switched on the projector. Practice made perfect, although familiarity had not bred contempt. The seat and its weird helmet still looked ominous, reminding him of another kind of chair that he never wished to see.

Fundamental force flooded his ego while he sat there and glared at the man behind the open window just across the street. Jensen was intelligent enough to have improved on the work of the undoubtedly brainy Wane! He leaned slightly forward in his seat so that when his deserted body slumped it would knock a second switch and close the projector. A Jensen refinement, that one. He was proud of it.

Within thirty seconds he was free. He was also across the street, in that room, and in that other body, the ungodly transference taking place with familiar rapidity.

AN OVERWHELMING power and mighty triumph were features of his nonmaterial fiber as he fought to eject the other's stubborn psyche. This victim was a tough specimen, far stronger, far more determined and infinitely more desperate than any the invader had yet tackled. He was resisting with all the ferocity and with all the tenacity of a prehistoric reptile.

The disputed body staggered and weaved around the room while two personalities fought insanely for complete ownership. It gasped occasionally, made vague struggling motions and many ghastly gesticulations. Twice it fell, rolled over with eerie writhings, retched violently, then clambered awkwardly to its uncertain feet.

Already Jensen's power was com-

mencing to decrease but still his spiritual force was abnormal. He knew now that he could never have conquered this tigerish personality unaided by the strength he had gained from the projector. But he did conquer. The body collapsed again as with a tremendous effort he thrust its owner from the world of material life, and in these new ears, this fresh brain he heard the terrible susurrations of the psyche that he had damned.

Perspiration beaded his new form as Jensen came upright, propped himself against a wall and breathed with heavy sobbing sounds. His extra vibrancy was now almost gone, he was nearly back to normal, and his legs felt weak. But he was in possession! He passed his satisfied grin along to Wane as that person opened the door, paused in the gap and stared at him.

"Oh," said Wane, looking slightly uncertain. "I thought— Aren't you, Jensen?"

"So you've guessed it." Finding the corner of the desk, Jensen seated himself on it. He felt a lot better now. Dynamic, that was the word for it. Full of confidence. "You sure are a shrewd old cuss, but not clever enough to realize the possibilities of your own inventions. You thought I'd sell it, eh?" He laughed, stopped at the deep, sneering sound of his new voice, then laughed again. "I'd be a fool to sell the key to immortality."

Still standing imperturbably in the doorway, Wane said, "Ah, yes, immortality. I understood it too late." He smoothed his white locks. "The device is excellent. I have no cause to be ashamed of it. Its only fault is that it has come many centuries too soon. Humanity is not ready for it." He raised his tired eyes, looked directly into Jensen's

mocking ones. "I shall destroy it."

"Don't kid yourself," Jensen advised, easily. "And don't lounge there like a dummy. Come inside. I want all the information you can give about the guy I'm now supposed to be."

"Of course, of course," agreed Wane, speaking very, very gently. He entered the room. A pair of tall, broad-shouldered and efficient-looking individuals followed him in. "You are," informed Wane, "no less a person than Enrico Rapalli, otherwise known as Public Enemy No. 1."

A hellish photomontage flamed in Jensen's mind: the long and bloody list of Rapalli's crimes. The record had been made while Jensen was in jail, and he'd seen the master criminal's picture only once. No wonder that hard face had looked familiar. No wonder that psyche had been so ferociously reptilian.

"I went to Washington and reported everything," Wane continued, his voice still gentle. "The Federal agents had located Rapalli and were about to take him. They agreed to my suggestion and kept off him while I used him as bait. My advertisement appeared in a score of papers for ten days before you swallowed the hook. I then made the appointment you wanted. I made it here, at Rapalli's hide-out, and the Fed-

eral men kindly arranged to have the opposite apartment made vacant. Immediately you moved in with the projector we knew we'd got you where we wanted you." Again he smoothed his locks. "Now I must destroy my projector."

"Come along, Rapalli," growled one of the pair.

"I'm not Rapalli," shouted Jensen, his face livid. "I'm . . . I'm—"

"Well, who are you?" The questioner permitted himself a hard smile. "You've Rapalli's face, Bertillon measurements, fingerprints and body marks. You've got Rapalli's body—and that's all the law wants to have, all the law is going to burn."

"Damn you," bellowed Jensen as cold steel circled his wrists. His wild eyes found Wane going through the doorway; he struggled futilely, hurled a string of vicious curses at the little scientist.

Wane turned, looked at him, said, softly, "Jensen, I'm really sorry for you. Your next seat will be the seat of death. That is nothing, nothing at all," he moistened his lips, "if death means complete dissolution." His silence was long before he finished what he wanted to say. "If it doesn't, your psyche will go somewhere—and find others waiting!"

THE END



Continued from page 6

and five minutes it covered 3,300 miles plus some extra due to the diminishing resistance of Earth's pull. In the tenth minute—from ten to eleven minutes after departure—it would climb 4,850,000 feet or nearly 1,000 miles. Since that's a five-gravity drive, the force exerted is 500 tons, or 1,000,000 pounds. Total power: 4,850,000,000,000 foot-pounds per minute. Divided by 33,000 foot-pounds per minute—which is one horsepower—we find the rocket engine must have developed something like 147,000,000 horsepower.

And 1,470,000 horsepower per ton is a pretty handy driving power!

Of course, if we take our horsepower readings a little later, after the crew's had a chance to get a little more accustomed to the excess weight—say at twenty minutes out—we'll find that the power has increased to about 6,000,000 horsepower per ton. Ship'll be going four times as fast by that time, of course.

It begins to look as though rocketship engines simply can't be adequately rated in terms of horsepower. Be sort of silly to explain, "Well, of course, it develops only twenty horsepower per pound here on Earth, but on the last trip to Callisto, when we were halfway there, we opened up to avoid a meteor and the instruments showed she developed 3,500,000,000,000,000,000,000 horsepower under our ten-gravity emergency acceleration."

Any suggestions as to how to make the power ratings seem a little more normal will be duly appreciated. You can *not* rate the horsepower of a rocket engine by its test-block power development, because any rocket whatsoever has exactly the same horsepower rating on an anchored test block. Zero, exactly.

Apparently, they'll have to rate rocket engines solely by the thrust developed. And engineers will have to give up their beloved horsepower terms.

For that matter, there are some other interesting problems in proper rating of rocket engines. In any heat engine, any engine converting the heat energy of a fuel to mechanical work, the efficiency can be measured by the drop in temperature of the fuel material within the engine. A good steam turbine, for instance, takes in steam at 900° and exhausts it cooled down well below the normal boiling point of water. (They exhaust into a partial vacuum, under conditions which lower the boiling point.)

But a rocket, if perfectly efficient, would exhaust its fuel in a streamed jet wherein all the molecules of gas moved in parallel paths. The gas would, in other words, be exhausted as a body moving in one direction—and at a temperature of absolute zero! Heat is random motion of the molecules; if all move in parallel paths, there is no heat.

That unattainable perfection is purely theoretical—but the practical jet would be hard to measure. Any measuring instrument introduced into the stream would disturb the flow, and radically alter the temperature. You can't very readily measure that temperature; to do so changes it.

Engineers will have a lovely time with rockets!

THE EDITOR.



BRASS TACKS

Better list Smith's story as of 1942, since many readers wait for all parts before reading a serial. Incidentally, "Second Stage Lensmen" is almost twice as long as one whole issue of the big 160-page Astounding!

Dear Mr. Campbell:

Just one more word on "Solution Unsatisfactory," then I shall hold my peace.

As you, Mr. Editor, commented on the letters which attempted to give solutions, the one fact overlooked was: How to keep the peace until "Utopia" was reached? As the problem was set up in the story, I fear there is no simple solution. For this situation the proverbial "ounce of prevention" seems to be the *only* cure. It will be a race to determine whether society can advance to the point where it can take care of itself before such a weapon is invented. In the normal course of events we might despair of the outcome, but perhaps we of today may be permitted to observe what the human race may do under "forced draft."

In recent issues of Astounding I have noticed the word "semantics" often mentioned. Can you recommend a book on the subject, so I may know what you are talking about?

Having just finished the July and August issues nearly simultaneously, I will comment briefly. The most "rememberable" story in the two issues was "—We Also Walk Dogs." The August cover is a masterpiece; and I see you have adopted my

favorite method of blocking-off the print on the covers. Schneeman's first picture for "The Seesaw" is way above average, and Kolliker's first for "—We Also Walk Dogs" made me turn back to see if, by chance, you were using some of the work of Charles Paul. M. Isip's for "Backlash" also rates high. Hope we get lots of above-average work on the new E. E. Smith story.

By the way, that reminds me—if we are to vote in an Analytical Lab for the year, let us decide now and uniformly whether to vote the Smith tale in '41 or '42. Since we will read most of it before December 31st, I say let's put it in 1941.

I await with interest the promised "blue-willies" ending of Heinlein's "Methuselah's Children."

Personal note: Outside of the Smith epics, the most memorable tale of past years in Astounding was "Forgetfulness." Queerly—I *can't* forget it!—L. M. Jensen, Box 35, Cowley, Wyoming.

He doesn't like Fort.

Dear Campbell:

The recent republication of the books of the late Charles Fort has brought out a rash of reviews, including the recent one in your own excellent publication. All those that I have read so far treat Mr. Fort with great tolerance and circumspection. I suppose they figure: mustn't be dogmatic, ha ha; after all, Fort was the enemy of dogmatism, not science

—doesn't Mr. Thayer say so in his preface? —and we'd be committing the very crime he inveighed against.

Well, why so damned polite? Mr. Fort was not gentle in his treatment of astronomers; he was not only dogmatic, but downright scurrilous, homharding them with such terms as "incompetence, conspiracy, connivance, imposture, imposition, concoctions, tainted agreement between the physicists and the astronomers, worthless observations, extravagant claims, pseudo-astronomy—" This is no doubt the uproarious gusto promised by Mr. Thayer. Personally I doubt whether a lack of inhibitions with respect to the use of epithets is the same thing as a sense of humor, though it may be mildly amusing. Just as a playwright need not have humor to make one of his characters come right out and say "God-damned," though some of the audience will still snicker a little when this occurs. But, having given Mr. Fort's collected opi some critical scrutiny lately, I think it is high time somebody put away the kid gloves, the tongs, and the feather duster, and got out the same sledge hammer and butcher's cleaver that Mr. Fort wielded with such myopic enthusiasm.

First, of course, I will gladly admit that Fort's collection of *curiosa* is interesting in its own light, and that the compilation thereof was a meritorious piece of work. I will also admit that there have been incompetent and dogmatic scientists, that some of them have perpetrated impostures, et cetera, et cetera. It could hardly be otherwise, since scientists are people just like the rest of us. As far as their dogmatism goes, I have known a fair number of practicing scientists personally, and can state that these at least are no more dogmatic than the members of such other groups as I have known: playboys, unskilled laborers, debutantes, actors, lumberjacks, salesmen, country squires, clerical workers, physicians, lawyers, soldiers, engineers, editors, domestics, et cetera, and certainly less so than businessmen and schoolteachers, who were much the worst. Clergymen are in a class by themselves. It was true of some of them that they were quiet scientifically undogmatic where their own specialties were concerned, but out-dogmatized the late W. J. Bryan when they got off in some exotic field like politics.

However, Fort's work is not merely a collection of inexplicable oddities, or a caution against a too-lurid extrapolation of insufficient data, or a warning never to think that the last word has been ever said

in any branch of science. Books on the philosophy of science are full of the second and third, anyway; have been or years. Fort also attempted to tie together his unruly data by a geocentric hypothesis of his own, a kind of modified Ptolemaic theory. He may or may not have believed the suggested details of the cosmogony which he throws out here and there, but despite his and Mr. Thayer's disclaimers, I think that he took his central stationary-Earth idea pretty seriously. To support it he felt obliged to attack the whole corpus of modern heliocentric thought as developed by Copernicus, Kepler, Laplace, et cetera, in fact to assail the competence and impeach the probity of the great majority of professional astronomers from Galileo on down. We are certainly entitled to examine the how, why and wherefore of this attack, to check up to see whether the astronomers are guilty of the crimes attributed to them, or whether they were in fact crimes at all, and to judge Mr. Fort accordingly.

In the first place, in his repeated denials of the Earth's motion, he seems never to have heard of the elementary idea that all motion is *relative*; that a thing can only be said to move or rest with relation to a frame of reference, and that no one all-embracing frame of reference for the whole universe is known. Therefore the frame we choose is a matter of expediency. Several "orthodox" modern astronomers have pointed out that if you take the Earth as your frame, as you are fully entitled to do, then it is quite true that the Earth stands still and all the rest of the universe revolves around it. The reason for taking the Sun as the frame of reference for the Solar System is that in that way we can describe the motions of the members of this system much more simply. The motions of the planets correlate quite neatly with the laws of the attraction of masses—to use the old-fashioned Newtonian way of putting it—which can be checked by some quite simple experiments with lead weights and sensitive balances right here on Earth. These experiments work, whatever Mr. Fort may say; I performed one myself and witnessed others.

If we take the Earth as our frame, the motions of the planets become Ptolemy's famous looping curves that correlate with nothing whatever. That's no disadvantage from Mr. Fort's point of view, since he dislikes mathematical explanations of cosmic matters, anyway. Mr. F.'s view, however, contravenes one of the best-established principles of scientific reasoning: the uni-

formity of natural law, without which it is hard to see how we'd have gotten beyond the science of the twelfth century.

He attacks what he says are the three main arguments for the Earth's motion, thus: the aberration forms of stars are circles, or ellipses, or straight lines, whereas they should not be if the Solar System is moving. Fact is that they are not circles, et cetera, but figures like a bed spring seen almost but not quite end on; in other words the images don't quite come back to where they started on each circuit. But the difference is too slight to be shown up by a single circuit.

Two: given this motion of the system, the proper motions of stars should have added up sufficiently to have distorted the constellations within historic times. I don't know where he got his arithmetic, but the typical proper motions of the more prominent stars are around three seconds per century. A few fast ones have proper motions like that of Alpha Centauri, with 3.66 seconds per year, but that's only about one degree in 985 years, so no wonder "not a star . . . has changed more than doubtfully since the stars were catalogued by Hipparchus." No argument.

Three: annual shift of lines of stellar spectra—here Fort merely cites contradictory estimates made from spectroscopic observations of the speed of rotation of Venus, the rings of Saturn, et cetera, never mentioning that these are bodies shining by reflected light, and therefore a quite different and much more difficult spectroscopic problem than a self-luminous body like a star or a neon tube. Not that Fort goes into the details of spectroscopy, to show how spectroscopes don't work and why; by a convenient series of half truths he can create the impression that any piece of apparatus more complicated than a shaving mirror is a meaningless Rube Goldberg contraption concocted by pseudo-scientists to hoodwink the public, and nobody ever proved anything by a spectroscope.

On page 356 he speaks again of Solar-System motion compounded with orbital motion: "—if part of the time this Earth . . . moves at a rate of 19 plus 13 miles per second, and then part of the time at 19 minus 13 miles a second—" True if the system were moving in a direction in the plane of the Earth's orbit; unfortunately it's headed for Hercules, about 35 degrees north thereof, as Fort knew perfectly well. So we're left with a childish confusion between an arithmetic sum and a vector sum

or resultant; like saying that if I walk ten miles I'm bound to end ten miles from my starting point, regardless of whether I walked in a straight line.

There's much more; witness his cavalier dismissal of the Michelson-Morley determination of the speed of light; it was done with complicated machinery, so it must be the bunk— He's a hard man to please: if the scientists disagree, it's evidence that all concerned are wrong; if they agree, it's evidence of conspiracy. Does somebody determine the Moon's distance by triangulation? He cites conflicting estimates, by triangulation, of the height of Mauna Loa—going clear back to Captain Cook—to show that you can't prove anything by triangulation, either. Having no notion of scientific method, Fort is free to select his data as indiscriminately as he pleases, and thereby can prove anything he pleases.

If I wanted to make a similar attack of "orthodox" geography, I could do as follows: I'd cite the "Odyssey," Strabo's "Geography," the "Book of Ser Marco Polo," the entirely phony "Travels of Sir John Mandeville," the reports of Columbus, Quinos and Cook; Hakluyt's "Navigations," "Gulliver's Travels," and some articles from the current *National Geographic*; from the discrepancies and contradictions I'd infer that all the geographers and cartographers were liars who were out to fool all the public all the time. Then I'd throw out a suggestion of my own, that the real trouble was that the Earth was not a spheroid, but a tesseract.

Or if I wanted to discredit the physicians, I'd list the theories of Galen, Paracelsus, Harvey, Mesmer, and a lot of recent ideas, giving all the same weight; I'd bring in the hypotheses of the moribund homeopathic school, the East Indian herb doctors, and the Christian Scientists; and after all people still die, you know; and if they can't cure a little thing like a common cold, how do you expect them to accomplish anything with cholera or pneumonia? And have you ever actually *seen* a germ? Not a photograph; they don't prove anything; and in 1854 a Dr. Glopp of Yonkers was actually proved to be an unprincipled faker, and— The fact is, naturally, that diseases are sent out by a group of old men on a mountain in Tibet—

But that will give you an idea of the Fortean method. My own conclusion is that the large sections of Fort's works in

which he assaults "orthodox" astronomic theories and their authors constitute an irresponsible and ignorant attack on the science of astronomy—Thayer's preface to the contrary notwithstanding—of the same sort that modern biology has had to endure from the Fundamentalists and modern medicine from the faith-healers. And whatever may be the positive achievements of Fort in collecting alleged oddities, and whatever may be the occasional furtive natural fact behind one or more of these "excluded" data, I think that Fort's utter incompetence as a critic of those dear old conniving fossils, the orthodox scientists, should be mentioned—loudly—and often.—Caleb Northrup, New York, N. Y.

Split lips and "f" sounds.

Dear Mr. Campbell:

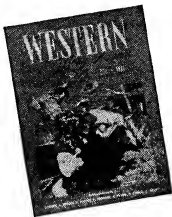
Just a line to accompany the coupon and remittance and to let you know how much I've enjoyed Heinlein's serial. In that yarn he has combined his socio-psychological emphasis with something of the power and sweep usually associated with Dr. Smith and has produced something, which aside from its value in relationship to his detailed "history," is a masterpiece in itself. Easily the year's best (to date). There is one point he makes that I'd appreciate enlightenment on. He states that because of the bifurcated upper lip the Jockaria could not pronounce the letters "m," "b," "v" nor "f." The first two I won't argue with, nor the third since I have no knowledge on the matter, but I beg to disagree on the "f." I lived for a number of years in South China, and the people who talk the Foochow dialect have no "f" in their language. The national language has the "f," but the Foochow person always uses a blurred "s" sound when trying to use the unfamiliar "f." I've tried with many of my Chinese friends to teach them how to pronounce the "f"—formed with the upper incisors and the lower lip—and have had very little success. Now, why should a split upper lip hinder the pronunciation of an "f"?

"Backlash" and "Jurisdiction" take second and third, and the article fourth place. The cover, of course, is good and the illustrations much better than fair, much.

What chance is there of getting a science-fiction and/or fantasy annual? Street & Smith seems to have done very well on the other annuals.

Good luck and thanks for the new Smith yarn.—Charles W. Jarvis, 2097 Iglehart Avenue, St. Paul, Minnesota.

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BEYOND ALL WEAPONS

By Nat Schachner

An absolute dictator with absolutely all weapons, can be defeated only by a being who is—beyond all weapons!

Illustrated by Schneeman

WHEN the knocking on the door came I was prepared for it. For more than two months I had been steeling myself against just what was going to happen. In a way, I

even welcomed the sound of it. It was finality—or just the beginning. The way I felt just then it didn't matter much any more either way.

It's no easy thing lying half awake

each night, in that dreadful in-between state that is neither sleep nor clarity, scheming, planning, nerving oneself against the inevitable knock that must come and yet unaccountably did not come, and getting up in the morning to find oneself drenched with sweat and so exhausted to present a cheerful face to one's wife and child.

The knocking increased. It was peremptory, authoritative, battering in its impatience.

"Damn them!" I thought bitterly. "Can't they wait a moment? They'll be waking Helen and the baby if they keep up that infernal racket. If only I can slip away, quietly."

It was the thought of these two that made me shiver suddenly, though it was a warm June night and the big lucite window was wide open behind the mesh of insect-killing current. I wanted to spare them; especially Helen. The baby was barely ten months old. I had a sealed letter all prepared, next my bed in a secret compartment of my night table. I hated partings. I hated tears—especially when they appeared in Helen's eyes. They made me all soft inside, and then I mightn't be able to go through with what I had to do.

Swiftly, yet quietly, I jerked my feet out of bed, pressed the tiny, fluorescent glow that spotted my clothes. Every night I had placed them into position so that I could pour into them in minimum time.

The knocking increased.

I pressed another button. It illuminated a small oblong on the outside door for the benefit of impatient visitors. "Wait, please!" it read. "I am coming."

But these were no ordinary visitors, and it was too much to expect them to understand and be gentlemen. The members of the dreaded

Deseco were not picked for their gentlemanly qualities.

I swore softly, snatched the sealed letter from its compartment, inserted it under Helen's pillow, raced feverishly into my clothes. Tie still awry, I hesitated a moment. Within the small circle of illumination, Helen's face etched itself into my memory. For all I knew I might never see her again. The chances were all against it.

She was still asleep, thank God! The knocking had ceased. In the silence I could hear her regular breathing, note the warm texture of her face, the long, silken lashes that I loved locked tight in peaceful slumber. One bare arm was thrown carelessly across the thin coverlet, as if seeking my presence next her. In the next room, asleep under the sheet in his specially built crib, was the baby. John, Jr. Jacky! I felt an almost irresistible desire to tip-toe in and take a final look. I restrained myself. There was no time. The Deseco was not used to waiting.

I took a deep breath. My eye moved rapidly around the room, to imprint on my mind every slightest detail. It took in the open window. For a single moment my resolution wavered. If I should dart suddenly through; slither through the shrubbery, and—

I laughed bitterly, silently. The Deseco were not fools. The house was watched on all sides. Out there, in the garden, lurked agents, waiting to shoot me down—with night cameras. Shot while attempting to escape—with pictures to prove it. It had been done before. I moved soft-soled toward the outer door.

"John! John Martin!"

I whirled.

Helen was out of bed, a nightrobe

thrust over her slim form, her eyes broken with anguish.

"Helen!" I exclaimed. "I thought you were asleep."

"I pretended," she sobbed. "I tried to be brave; not to make it more difficult for you." She came to me, and my arms went hungrily around her. "But I couldn't, my dear. They . . . they have come for you?"

I kissed her, not trusting myself to speak. I tried to tear myself away. But she clung to me, and her cheek was wet against mine. "He had no right," she sobbed, "the Master had no right to get you into this."

"The Master is always right," I said sternly. "Hush, darling! And please let me go. They won't wait—"

As if in answer a thin red line ran rapidly around the resistant medium of the door. There was a faint, sparking sound; then the door fell neatly inward, making a dull, metallic sound on the fibroid flooring. Three men stepped inside. Two were similarly attired in green uniforms with thin-lined circles of red on their sleeves to denote their status as Circle Guards. Their faces were wooden and blank of all expression, and their stiffly outthrust hands held the new vicious little short-wave guns.

The third man, slightly to the fore, was in civilian attire. His face was bland and smooth and his eyes had a kind, even merry look. A man to be passed over in a crowd, a man such as might be found in any office, stratosphere liner, moving walk or nodding with a satisfied air over a foam-capped beaker of rich, Polarian beer.

But I knew better. I knew him for what he was—a member of the Deseco—abrupt abbreviation for

Department of Secret Co-ordination. I myself was about to be co-ordinated.

"John Martin," he said.

"Yes," I answered, pretending surprise. "Why does the Deseco break into my house like this? What have I done?"

I could feel Helen's trembling against me.

I must say this for him—the agent was courteous. They always were courteous, damn them! It was one of their rules—to be courteous in public. It cost them nothing and made a good impression on people. How could such kind-looking, soft-spoken people be guilty of the nameless crimes that were surreptitiously charged to them? They must be the malicious tales of agitators, such as our dear Director has always warned us about. It would serve such scandalmongers right if we reported them.

Our dear Director! When you look into his eyes on the stereoscreen, as indeed is inevitable when you come to the assemblage halls every Sunday at ten in the morning in accordance with the summons, you get such a warm feeling about him. His eyes are so lustrous and full of infinite kindness that they send prickles of contentment up and down your spine. I swear to you, George, and to you, Adolph, that he looked directly at me all the time he was speaking. What? He was looking at *you*, George? What nonsense! As for you, Adolph, you always were rather vain. I tell you both he directed his words at me, and me alone! I can hardly wait for next Sunday. And please, Adolph, and please, George, don't get delusions about yourselves hereafter.

"The Deseco," said the agent courteously, addressing his remarks to my wife, "regret they were forced

to use the cutting flame on the door. But there was a delay in opening. I shall suggest in my report that a new door be installed for you, madame." He bowed. "As for you, John Martin"—he turned to me—"I regret exceedingly I cannot answer your question. You will please come along."

I had no choice. Those frozen Circle Guards had me covered; and outside there were more of them lurking in the shadows.

I said: "Very well, sir." And kissed my wife. Her lips strained against mine. I whispered to her: "There's a letter under your pillow. It tells you what to do, in case—"

Her eyes dilated, yet she nodded bravely. She understood. In case I never came back, I had meant, and left unuttered. Men who were arrested by the Deseco very rarely came back.

She was a brave girl. We both had known when we decided to follow the Master that things might turn out this way. We had agreed, nevertheless, after a long searching and discussion of possibilities, to take the grim chance. We owed it to ourselves as human beings; to little Jacky, sleeping peacefully in his crib with the innocence of the newborn. If life under the Director was intolerable for us, who at least had known something of the blessed preceding years of freedom, what would it prove for him?

It was the thought of Jacky growing up in that stifling, hypnotic climate, perhaps even yielding his mentality and assent to the constant, skillful hypnosis, that had decided us when news of the incredible Master had drifted to us on the surreptitious wings of furtive side whisperings. I had brought the tidings to Helen, and we had decided. Even

now I wasn't sorry, with the great test confronting me.

"Well?" said the agent impatiently.

"I'm coming," I answered quietly. Another hurried embrace and I gently disengaged myself from Helen's frozen form. My last sight of her was one of fierce-held immobility, her dark eyes wide on me with repressed anguish; then we were out in the warm, June breeze and I was thrust into a swift aërocar, armed with impenetrable vibrations.

The agent dropped into the seat next to me. The two Circle Guards entered behind, their guns watchful. A pressure of the foot and the car soared swiftly and swooped eastward.

"Where are we going?" I asked.

"It is not my business to answer you," he said seriously, "but I shall tell you. We are going to our great Director himself."

With automatic precision his left hand came up and pressed hard against his heart—or what passed for a heart among the Deseco.

"Live the Director!"

Behind me I heard the swift similar slapping of hands on hearts, and the simultaneous cry: "Live the Director!"

Then silence again and the soft rush of the aërocar.

It should have sounded funny, but it wasn't. Nothing connected with the Director could be considered funny. And I was too stunned by the information to think of anything else.

Evidently I was an unusual case. Ordinary victims of the Deseco—once numbered by the thousands, but now reduced to a mere trickle as the hypnosis spread—were usually whisked to Deseco quarters, where

nameless things happened of which only mere wisps of rumors filtered through. Hardly ever did one return; and when he did, he never spoke—not even to wife, to father or to son. But the Director was as one aloof, apart. Torture was a thing remote, and the bloody cries of groveling men. He sighed when he spoke of the Deseco—which was not often; some there still were who had failed to see the light. They were sick, perhaps; deluded, certainly. The Deseco chided and admonished, as a father would; they operated, as a surgeon would. But soon there would be no need—

My wits returned, and my brain churned furiously. I hadn't expected this. In my wildest dreams I hadn't figured on reaching the Director in person. The most approachable of men, seemingly; in fact, no one, not even his closest advisers, ever came to physical closeness. Always there was an impenetrable screen between—one that permitted sight and sound to pass with utmost readiness, yet forbade all other contacts.

I had expected, in my preparations, to be taken before the grim officials of the Deseco. I had planned each move in detail, as I would a board of chessmen. There had always been the chance that some violent sweep would send my pawns and castles tumbling into ruin, but I had been ready to face that chance.

Now, by some freak, my plans were ruined. Why had the Director sent for me? Did that mean that he was afraid? Or merely curious? Would my end come swiftly? Or with lingering, long-drawn suffering?

I tried to think things out. Through the slight vibration shimmer I stared out and down at the sliding city. Within the car was silence. The agent had regretted his

momentary burst of loquaciousness, and sat frowning at my side. Behind me the immobile Guards never wavered in their aim, alert for any sign of break. Not that there was anything I could do. The car was hermetically sealed; our flight skimmed the towers of Megalon by a good five hundred feet.

It was a beautiful night. I drank it in with the greedy gulps of a man who knows that he might never drink again. The city lay bathed in a glow of lapping fluorescent light. The towers pierced the glow like phosphorescent needles, clothed in countercurrents of shimmering color. Wide boulevards radiated to suburban peripheries from the central mass of the generating plant. Parks, museums, big amphitheatres and libraries clustered in the center. Then came the glass and steel upflings of the living quarters; and beyond, on the circumference, the silent miles of the technical plants.

Libraries! Museums! Broadcasters! Amphitheatres! All the elaborate apparatus for the mind; for wisdom and learning. But what books could now be read? What televised programs seen and heard? What art remained in the museums? What speaking, breathing pageants in the huge, receding tiers?

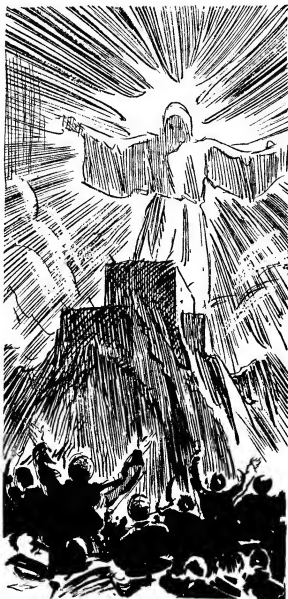
There had been no purge, no spectacular burnings of books and paintings. Oh, no! Nothing as crude and vulgar as that. Earlier, more primitive dictators might heap bonfires and declaim in ranting tones. Not the Director! There was reorganization. That was the word! Nothing was prohibited; but things disappeared. Quietly; without fuss or comment. Books that once were classics. History—Gibbon and Beard and James Harvey Robinson; philosophy—Spinoza and Dewey and Locke; drama—Shakespeare,

why, I didn't know, and Shaw and O'Neill; economics—Adam Smith and Sumner; novels went out en masse—one could never tell what passage in Dickens or Hugo or Thomas Mann might excite vestigial longings.

It wasn't that the shelves of the libraries or the plays for the stage were empty. Not at all! Plato and Hobbes and Aristotle and Pareto remained. Hegel, too, and the later Burke and the later Wordsworth. All who preached absolutism and a rigid discipline. And the gaps were filled with a rush of new yes-sayers, self-deluded converts and plain lick-spittles. I, who had been brought up on the iconoclasts and the seekers after truth, felt violent disgust every time I picked up a volume with the deadly monotonous red circle emblazoned on the cover in token of official approval.

The city fled behind, and the machine suburbs. Rolling park land succeeded, stocked with ever-new mutation-contrived species of plant and animal. Then, in the distance, high on a mountaintop, the severe straight lines of the aerie of the Director.

Nothing elaborate; nothing ornate. The Director was too smart to go in for lavish ostentation. People commented approvingly on his Spartan tastes, his eschewing of all luxury. They didn't realize that the exercise of power, the prompt obedience of an entire planet, made all other embodiments of sybaritism



pale to nothingness in the nostrils of men like the Director.

WE CIRCLED three times overhead, giving each time a code recognition signal, while search rays sought out our innermost vitals and a concealed armament stood ready to blast us

out of existence in case we didn't pass the tests.

At length suspicion died. The protective screen that had forced us into automatic circling opened slightly, and we slid down a narrow tunnel of vibrations to a landing stage where our seals were opened and grim, silent men in neutral gray took us over without a word.

The agent who had arrested me gulped, started to say something and changed his mind. There was something in the atmosphere that forbade words. Even to an agent of the Deseco.

He slid back into the aërocar, two badly frightened Circle Guards with him; the seals were set and he soared away. The screen parted briefly, closed again; and he was gone.

I was left alone—in the hands of the super-dreaded, legendary Pretorians—the personal men of the Director!

Not a word was spoken. The Pretorians were not given to useless chatter. They were more like automata than men. The will of the Director was their will; his life their life. Hypnosis could go no further.

The interior of the mountain retreat of the Director was a vast, honeycombed fortress. Swift-moving corridors, sudden upsurging platforms and down-dropping reversals, photoscanners and vibration screens, and Pretorians everywhere—silent, efficient, permitting our passage only on proper signal.

At last I was thrust into a chamber of flooding light, where my eyes blinked and blinded under a swirl of search rays. My skin prickled under the beating waves. I felt horribly naked and alone, as indeed I was. The rays probed like questing fingers, penetrating even the frail flesh and the convolutions of the

brain to pluck out whatever secrets I might possess. Gasping and shuddering like a swimmer under overwhelming waves, I nevertheless maintained sufficient control to hold myself rigid against the light hypnosis. I mustn't give way, I said to myself and clenched my teeth. It was so easy to surrender, to allow one's mind to drift along the patterned surge, to open one's thoughts like petals to the kindly probings of the Director. That way lay warmth and the luxury of surrender. Every fiber of my being cried for surcease. Why must I continue to fight? Why not yield and regain blissful consciousness? After all, what did stubborn individualism bring one except angular cacophonies and harsh dissonances? It was so hard to be alone and breast the constant buffetings of the tide; so easy to feel the comforting mold of uniformity, to let the Director decide. He was all-wise; all-knowing; all—

I snapped my head with deliberate violence; so hard that I felt the neck muscles wrench and rebound like released rubber bands. I cried out with pain; but the sharpness of the spasm, the brutal agony I had inflicted upon myself cleared away the hypnotic mists, brought my mind back to wary awareness. I had won—momentarily.

As if the unseen watcher knew that the rays had failed to do their work, the probing light died suddenly away. I blinked. The dazzlement fled from my eyes. I could see again.

THE DIRECTOR sat in front of me, observing me with thoughtful, inscrutable gaze. He sat behind a simple desk, in a room that was indistinguishable from a thousand offices in Megalon where modest executives

plied their modest affairs. His dress was as simple and unornamented—an olive-green military blouse and strapped trousers of a similar hue. Only the two tiny golden circles on the collar differentiated him from the meanest soldier in his command.

The Director did not go in for ostentation or vulgar display.

For the moment a sudden surge leaped through me. He was alone, not ten feet away. How simple it would be to leap the intervening distance, to strangle him with bare hands, and rid the earth of him once and for all. It would be so easy. He was slight of frame and not very athletic. I towered over him by at least four inches and I had kept in trim with swimming, tennis and mountain climbing. Instinctively I flexed for the forward drive. It would be so easy.

Then I caught myself. I was a fool! I had forgotten. Between the Director, observing me quietly with candid-seeming eyes and a curious smile, and myself there was a barrier. A mesh of invisible vibrations, impervious to any force known to man, behind which he was as safe as though he had been three thousand miles away.

He said: "That is better, John Martin. Three steps closer and you would have been annihilated. Which would have been a pity."

He was telling the truth, conversationally, without heat or bluster or anger. Which made him all the more terrible. I felt a light perspiration break out all over me.

"Mr. Director," I said, forcing my voice to steadiness, "an agent of the Deseco broke into my home and brought me here. I have no knowledge of any wrongdoing."

Mr. Director! He had no other name. If he had, it had been lost in the mists that surrounded his

early origin. Since he had come to power there had been no other title.

"Wrongdoing?" he countered. His pale, ascetic face seemed almost kindly. "Did the agent say anything like that?"

"No, but—"

"If he did, he exceeded his orders. I asked you here from friendly motives."

I laughed bitterly to myself, but allowed no hint of it to show on my face.

He leaned forward a trifle. "You do not appear to be an ordinary man, John Martin," he said. "I have been taking a warm interest in your career. Hun-m-m!" He rattled off the facts of my life as if he were reading from a dossier in the files of the Deseco. "Born in 1995 of the Barbaric Era of a family of six—two brothers and four sisters. Father and mother now dead; two sisters dead; the brother killed in the Change. You made a name for yourself in the field of Psycho-History and taught at the University of Megalon. You suffered a bad accident while scaling Mount McKinley by a new and supposedly inaccessible ascent. You were laid up for more than a year. This was during the Change."

He drummed thoughtfully on the desk with his womanish fingers. "Thereby you avoided declaring yourself, as practically everyone else did. We did not bother then with hospital cases. We were, I must admit, not as efficient in our methods during the Change as we might have been. Your brother, however, did declare himself. He was stubborn and rooted in the Barbaric Era."

I said nothing. Not even a muscle twitched. Poor Bill! They had come for him and shot him—in front of his wife and Alice, our sister. Alice had snatched up a gun and

been shot down in turn. Jane, his wife, had merely fainted. Two months later, she died, her mind mercifully darkened against the tragedy.

"When you recovered," pursued the Director, "you were permitted to retain your position at the University. You took the oath of the New Era; you've attended the weekly Assemblies and done everything that has been outwardly required of all good and loyal citizens. You married, and you have a child. Therein you have partially fulfilled your duties, though not sufficiently to meet with proper approval. Good citizens who have been married, as you have, for five years, should have had at least three young citizens for the State."

Still I said nothing. Helen and I had decided at first to bring no slaves into the world. But the forces of human nature and human instincts are sometimes too strong for austere determinations. Marriage without children is only partially complete.

The Director puckered his brow. "Your teaching was closely observed. Purely as a matter of routine, John Martin. There are reports from your president, from your colleagues, from students in your classes."

"Has there been any charge laid against me for false teachings?" I inquired. "I knew I had not been brought here to answer any such charge. The Director wouldn't have bothered himself with any routine affair like that. There were other methods. And I had been very careful in class and in my private speech at the University. I was well aware of the honeycomb of espionage. But I thought it wiser to betray no awareness of the real reason for my arrest."

"No-o," he admitted. "Your

teaching was correct; you followed the accepted syllabus concerning the Barbaric Era, the Change, and the New Era. Yet the reports show a certain doubt. Nothing to justify summary action. An insufficient enthusiasm, perhaps; a faint irony and shadings of the voice in the wrong places. But these were subjective qualities. The reporters might have erred through excess of natural zeal. At least until a month ago."

I stiffened. Here it was coming. "I am not aware of any change then," I said carefully.

His smile was suddenly no longer pleasant. "It will do you no good to pretend, John Martin," he said harshly. "You are not as stupid as the other dupes. The others have spoken. All who have been brought before me. They yielded readily to the light treatment. They opened their minds and their thoughts. They told me everything they knew." His fingers made loud sounds on the desk. "But you have resisted. You closed yourself. You lead me to suspect that you have sat through the Assemblies in similar stubborn resistance. You pretended submission when secretly you were rebellious. You know, of course, what happens to men who are stubborn."

"I have seen specimens of your handiwork," I admitted.

He glanced at me sharply, but my face betrayed nothing.

"Then think well before you persist." His words jerked out at me. "Who is this man who calls himself the Master? Where is he now? Tell me?"

I HAD BEEN thinking well and swiftly all during this strange interview. My plans had been upset by my failure to be taken before the Deseco. I had to shift them suddenly, and quickly, to meet this un-

at last

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expected situation. I had known for some time that others had been arrested; but I hadn't known they had been taken to the Director. None of them had returned.

I denied nothing. All I said was: "It didn't help the others any that they spoke."

He smiled. He was close to victory. "You needn't fear about that, John Martin. If you speak well and truly, you shall go free. I shall realize that you were misled by a cunning scoundrel and impostor. Why, we shall permit you to retain your position at the University. Perhaps, if you show the proper frame of mind, you might even find a Rectorship open."

So the Director was offering me a bribe? The Rectorship! There were only six of these in the world. Rulers of the educational systems; one for each continent. Wielders of vast powers under him.

That meant two things. First, that the Director was seriously perturbed. The unknown presence of the Master was an irritant. The secret propaganda was effective then; more effective than he would be prepared to admit. I had been wondering about that. There had been so little chance of finding out. Second, that the other disciples whom he had captured had been able to disclose practically nothing. But then, how could they have told much, even if they had wished? I took a deep breath and decided on my proper course.

"Let's get down to brass tacks," I said boldly. "The others told you nothing, because they knew nothing. The Master knows whom to trust. He is beyond your vengeance or the vengeance of the Deseco. He laughs at your puny hypnotic powers, based as they are on ordinary, everyday scientific principles."

The Director's eyes were dangerous. But I plunged on recklessly. "Yes, mass hypnotism—that has been your secret weapon. You may have deluded most of the world, but you forget I studied psycho-history in what you are pleased to call the Barbaric Era. Earlier dictators than you fumbled around with the idea of mass hypnosis. There was a man named Hitler back in the 1930s and '40s who used it with some crude success. But he didn't know anything about the scientific end of it. He employed no hypnosis rays or skillful projections to break into the unconscious and the subliminal thresholds. He relied on a raucous voice and emotional reiterations. You have been far cleverer. Your Sunday Assemblies renew your contacts with all the earth, rebathing the poor dupes in hypnosis rays and sliding afresh the projectional suggestions of your voice and mind into theirs."

For a moment I stood silent then, rather aghast at myself. Had I overplayed my hand? Had I, by my provocative boldness, brought the Director to such a pitch of rage that he would annihilate me where I stood? That he had the necessary weapons within range of those tight, white-knuckled fingers I had no doubt. And his face betrayed, through its swift suffusion, just such a murderous impulse.

But I hadn't overrated him. He was at least as clever and as brilliant in improvisations as I had given him credit for. He *had* to be. Otherwise he couldn't have attained the heights he had. He was no fanatical madman, as some of the earlier local dictators had been; and even they, in their madness, had perforce shown flashes of genius. He had learned from their mistakes and eventual defeats; he had evolved a

new and highly intellectualized technique.

But I don't mind saying that I felt considerably relieved when he suddenly relaxed and even smiled. It's one thing to work out a theoretical analysis of a given psychological situation; and another to have it work in practice. Especially when failure meant torture and violent death.

"John Martin," he said approvingly, "you are a brave man and you have a stubborn mind. You never, in fact, yielded to the hypnosis?"

"No."

"And you admit that you know the identity of this charlatan called the Master, though the others did not?"

"Yes."

He leaned back in his chair and smiled with a benevolence I did not trust.

"Good!" he said. "We understand each other. I need make no pretenses to you. This so-called Master is trying to stir up trouble. Not that he can really do anything. All that it amounts to is a lot of whispering and rumor mongering. Here and there some weak-minded individual might succumb; and then I'd regretfully have to dispense with him. The Earth I planned has no place for doubters and malecontents."

"No," I said.

A shade of suspicion crossed his face; vanished. "Exactly. It's really his poor dupes I'm thinking of. Otherwise I wouldn't pay the slightest attention to the whole thing. It's ridiculous—this nonsense about a superman; a Master from another planet. No reasonable man would think twice about such a stupid charlatan. But it pains me to have to eliminate those whom he has

enmeshed with his lying promises. Therefore I wish to get rid of him once and for all."

"I don't doubt it," I said.

Again suspicion flitted over his countenance. Perhaps he detected a certain delicate irony in my agreements.

"You are the only one who knows his true identity?"

"I wouldn't say that," I replied carefully. "There may be others. Very likely there are. I don't know. And as to his true identity—that also is hard to say about someone who is obviously not a human Earthman."

THE DIRECTOR controlled himself. My respect for him grew. He did not yield easily to clouding emotions and was, therefore, all the more dangerous. He even essayed an indulgent laugh.

"Come now, John Martin"—he smiled—"surely you don't expect me to believe this poppycock about a man from Saturn come to Earth with superhuman powers to set things right. And I know you're too intelligent to believe it, either. That may be all right for the common herd, but not for us. Confess the truth. He's an ordinary human being—some scientist, perhaps, who managed to escape the Change—who thinks he's clever enough to overthrow me with such silly nonsense. Any fakir, with a little simple apparatus, can manage to impress a certain number of the feeble-minded. But as for overcoming me—"

"You're wrong, Mr. Director," I told him earnestly. "You're terribly wrong. As you say, I'm not one to be taken in easily. But I've *seen* the Master. I've seen him more than once. And I believe. It is impossible *not* to believe, once

you have met him face to face. He is not of this Earth. Whether he actually came from Saturn, or from another planet, I have only his word. But that he came from another world, is without question. I have seen him do things—"

I checked myself. I was saying too much.

The Director looked eager. "What, for example?"

"I cannot tell you," I answered doggedly. "It is not my secret to divulge. Besides, he has promised to divulge himself openly."

"Ah! And when is that great day?"

"On the Fourth of July." I had no qualms about mentioning the date. It had been bruited about in whispers. The Director must have known about it. The Deseco, as I think I've already remarked, are pretty efficient.

In fact, he didn't seem at all surprised. He grinned; but I thought I detected a faint shade of anxiety under the grin. "The Fourth of July, eh? What a coincidence! A man from Saturn utilizing a date like that—all men are created free and equal—bah!" He wrinkled his nose in disgust. "Confess now. Doesn't that alone show his human origin?"

I shook my head. "Not at all. He knows human history better than I do; and I'm supposed to be something of a specialist in it. He told me things that had happened; for example— But, well, never mind. The point is he's going to take over the Earth on that day. He's going to take it over no matter what precautions are made against him; no matter what weapons are employed to defend your power. And once he has taken it, he intends to liberate mankind; free them from dictatorship and tyranny. On Saturn, he

says, those things went out many thousands and millions of years ago."

"And, of course," sneered the Director, "I'll stand by idly and watch him do it."

"You won't," I said. "But it won't matter what you do. You'll be dead."

A spasm must have run through him; but I couldn't note a sign. Whatever his faults, the Director was no coward.

He tapped the desk thoughtfully. "Well, well! And why should this superman wait until the Fourth of July? Why not act at once?"

I had thought of that myself. "I don't know," I admitted. "One just doesn't ask questions of the Master. One listens."

The Director nodded. "With all your intelligence, John Martin," he told me, "that represents the difference between you and me. *I'm* not afraid to ask questions; to penetrate mumbo jumbos. Tell me where to find him, and I'll ask him plenty of questions."

"I'm sorry I can't tell you that." He frowned. "You know and you won't tell?"

I hesitated a fraction of an instant. "I didn't mean that," I then said hastily. "I . . . I don't know. Whenever he wants me, he comes to me—unexpectedly. I never know when it's going to happen."

"You lie, John Martin. You know his hide-out."

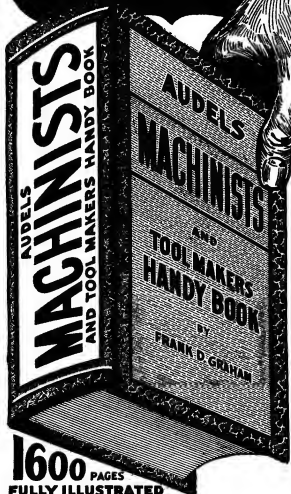
"I've told you the truth." I tried to put the ring of sincerity in the denial, but I could see I didn't convince him.

"Would torture help your memory?" he suggested softly.

I checked a certain shivering. I looked him straight in the face. "It would not," I declared.

"I didn't think it would," he ad-

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mitted. "I know your breed. You'd go to your death without a quiver. But suppose your wife—"

My inner ague increased. I had been dreading that possibility. The Director would stop at nothing to waylay the Master. I had an agonized mental picture of Helen in the grip of the Deseco. Yet I managed calmly: "That wouldn't help, either, Mr. Director. Nor could the torture wrest it from her. She doesn't know where he is."

"I know she doesn't," he agreed unexpectedly.

I showed surprise. "You know that?" I cried.

"You're really not as intelligent as you think yourself," he said with a sarcastic smile. "You're not much of a conspirator, leaving notes around for your wife. I can't think much of your Master if he has to rely upon such tools as you."

"But . . . but—" I spluttered.

"The Deseco never does a botched job. There was more than one agent. When you left, under guard, the others watched through their spy instruments. They saw your wife take the letter from under the pillow. They broke in immediately and took it away from her."

I said "Damn!" fervently. Luckily the note contained nothing really incriminating. In fact, I remembered I had written something to the effect that now I was caught, I was willing to admit that I should have taken her advice and had no dealing with the Master. I asked her forgiveness for the trouble I had brought upon her and to forget me as well as a being she had never seen or really believed in.

I straightened. "That note," I said harshly, "was designed to make my wife feel better. Whatever I had done I had done against her pleadings. But don't think it states

the truth. I'm not sorry, nor will I ever be, no matter what happens. Even if I die today, and my whole family succumbs to your gentle ministrations, it won't make the slightest difference. On July 4th the Master takes over; and you will die."

A FAINT LINE creased his brows; smoothed out. He considered me, standing there flushed and defiant. I would have given anything to have been able to read what was going on behind that smooth façade. My life hung precariously in the balance. The lives of Helen and Jacky. More than that, even.

There was a sick feeling in the pit of my stomach. Had I gambled and lost? Had I misread the super-clever mentality of the Director? Would the co-ordinates of my carefully plotted fight for life go crashing?

The moments moved on in interminable array. They turned into minutes, and the minutes into hours. Time blurred and stood still. The palms of my hands sweated; I had been holding my breath for uncounted days. The silence was insupportable.

Then the words of the Director, soft though they were in fact, crashed like resounding thunder about my ears. I tried desperately to clear them, to bring them from a noisy jumble to ordered meaning.

"You are a sick man," he was saying with a half-regretful sigh. "I should turn you over to the Deseco for proper . . . ah . . . manipulation. But I won't."

I dared not try to fathom what he intended. Perhaps he was playing with me as a cat with a mouse. I held my breath.

He shook his head. "No, John Martin. I have decided. Your Mas-

ter is harmless. So are you. You are flies buzzing on the flanks of a mountain. I shall no longer compromise my dignity by paying the slightest attention to either of you. You are free, John Martin."

A sweat broke out all over me. I didn't believe it. He was still playing with me; lifting me into hope so that he could dash me down from a greater height.

"You mean I am free to . . . to go?" I gasped.

His smile was cordial. "Without any strings or limitations. You may even return to the University. That should give you an idea of my apprehensions concerning your mountebank man from Saturn or his vain threat about the Fourth of July."

He pressed a button. As if by magic a Pretorian appeared at my side. The Director's smile was broad, carefree.

"Take John Martin back to Megalon," he said gently. "And turn him loose. I shall hold you responsible for any harm that may come to him on the way."

The Pretorian saluted, hand slapping smartly against his chest. "Live the Director!" Then his face froze into a mask again.

"Well, what are you waiting for?" demanded the Director of me. "Have you lost your wits?"

I was indeed as one bereft of sense. My knees trembled. It was still difficult to believe. I had gambled, and I had won—so far, at any rate. I had pitted my psychology analysis against torture and death, and fact had followed theory. The Director was a very clever man. Had he been less clever—or more clever—I would be now on my way to the private chambers of the Deseco; not to freedom.

I found my voice and tried to

keep it steady. "You are kind, Mr. Director."

"Kind?" He dismissed it with contemptuous gesture. "Not at all. Indifferent, rather. Indifferent to the blustering of charlatans. On the Fourth of July, John Martin, I shall go fishing."

He disappeared suddenly. The intervening vibrations solidified into a wall. It was an effective gesture of dismissal.

The Pretorian said: "Come!" They wasted no words.

I WENT ALONG, my brain a seething caldron of thoughts and emotions. I had faced death and been reprieved. Yet suspicion still lurked and held my breath to shallow, gusty drafts until the night air greeted us again and we had taken off—the Pretorian and I—in a fast aërocar.

Even then, it was only when I saw the eternal glow of Megalon lifting over the horizon that I felt I was in fact temporarily free. For the first time the bands about my heart and chest loosened, and the blood began to circulate properly again.

I began to plan, fiercely, rapidly. I had won the first round; but there would be others.

The Pretorian cleared his throat. It had an unusual, hesitating sound. It was the third time he had cleared it thus. In my preoccupation I had not given it the proper attention before.

I looked at him in surprise.

There was a curiously anxious expression on his face. As though he wanted to speak, and was fumbling for words. It was very strange. He seemed suddenly human; not a Pretorian at all.

"Yes?" I said.

He took courage from that. "Is

... is it true you have seen this human they call the Master?"

"Yes."

"Is he ... is he really as super-human as they claim he is?"

"Yes," I said.

There is an art in monosyllables.

The Pretorian looked hastily at the spy unit in the rushing aërocar. It was closed. Nevertheless he sidled closer to me on the seat; whispered.

"You are the first man I have met who has actually seen him. We were talking about it on guard last night. My comrade claims to know a man who knows someone else who has seen the Master. Is it true he is a hundred feet tall and can kill just by looking at you?"

"I am sorry," I said carefully. "I am not allowed to say."

The Pretorian nodded, as if he understood how it was. He considered another moment.

"What's going to happen on the fourth of next month?"

"I don't know."

"But they say—"

"They say lots of things. The Master didn't tell me. I am only a human; not one of his own kind. I only hope it isn't going to be too terrible."

Air exhaled from the Pretorian's chest. A pallor came upon his face. He didn't say anything more the rest of the journey.

Except as we landed, and before the seal closed on him again, he thrust his head out suddenly. "Does he know who believes in him and who doesn't?"

"I don't know," I told him honestly. "Thoughts are secret things; but actions are not."

"Ah-h-h!" he said. And I left him there while I hurried to the house to meet those whom I had never thought to meet again.

DAWN was just breaking and the house was enveloped in a mantle of filagreed mist. In the distance Megalon glowed like a great jewel and the sun made a red ribbon of fire along the still-dark mountains from which I had just returned.

But the house was dark and silent, and I suffered a thousand deaths before the scanner approved of me and let me in.

"Helen!" I cried into the dark. "I'm back! Helen!"

I heard the muffled sound of sobbing; then a quick swish of fabric and an incredulous voice: "John! Is it ... can it—"

"It is—and it can," I cried as lightly as I could with my throat tight and dry. "I've returned. See, didn't I tell you?"

The light went on with a rush, and Helen was straining to me as though she wished to interpenetrate my being.

"It's all right," I said, patting her head. "So far, at any rate. Things worked out even better than I had dared hope."

Arm tight around her, I went in to see Jacky. In the misty half light he stirred, blinked and returned to his dreams. We kissed him and went back to the main chamber. Helen was breathless with questions. I told her what was fit for her to know. It was far better, I had determined at the beginning of this complicated business, that she did not know too much.

"But I don't understand," she said with a mixture of flooding relief and utter bewilderment. "The Director himself! And he permitted you to go?"

"The Director is a very clever man," I said softly. "I am just a tool, a worthless creature. It's the Master he wants. He pretended to mock; but he's scared. I could see

it in every move he made; in the very lack of fear he was careful to display. Suppose he killed me. That wouldn't bring him a step closer to the elimination of the real danger."

"The Master?"

"Yes. In his mind there's a conflict raging. His reason tells him the Master's some Earthman, pretending to superhuman powers. But his imagination is uneasy. Suppose a Saturnian *had* come to Earth? Like a prudent man the Director is determined, no matter how, to get rid of this possible menace. He's got his spies and the Deseco searching every cranny in the world. And the search has failed. That frightens him just a little more. The Fourth of July is less than a month away. The Deseco reports a growing uneasiness among the people, especially around Megalon. And the rumors are spreading. Fast, the way all rumors spread. He must scotch the thing at once; otherwise there's no telling what might happen. And the way to scotch it is to produce the Master—a chained prisoner."

"But you, darling! What is your place in this?"

I laughed grimly. "I'm the decoy. He knows I've seen the Master. He expects me to meet him again. I'm to lead the Deseco to the head and front of the agitation. Even now agents are lurking outside. In a moment or two their spy instruments are going to be set up. When that happens, dear, we talk trivialities; and keep on talking them."

Helen was icy cold. Her face was drawn with fear. "John, darling, you mustn't go in with this. Let the Master find other men to help him. I couldn't stand another night like this one. If he's so powerful, he can free the Earth without your help or anyone else's."

AST—10a

"God helps those who help themselves!" I said laconically. And, without transition, I went gayly on. "I'm tired, sweet. Let's get to bed. I want to get up early tomorrow morning. I want to see President Gorham of the University to arrange for a leave of absence. Would you believe it, darling, that I fooled the Director completely? He thinks the Master comes to me. As if the Master would deign do such a thing! I'm going to *him*."

Helen looked at me frozen-eyed. Words quivered on her lips. I squeezed them off with sudden pressure on her arm and a significant side glance at the tiny detector I had installed inside the timepiece on the wall. The minute hand was glowing a faint red. Only one who was looking for it could note the shift in color.

My wife is all right! Desperate as was her fear and wonder, she understood. The detector had picked up the vibrations of spy instruments. We were under surveillance. "I wish you'd not talk that way," she said with just the right troubled note in her voice. "You ought to be thankful to our great Director for giving you a second chance. I hate your Master, whoever he is. Don't have anything more to do with him."

"Keep your nose out of my affairs," I said roughly. "You're as bad as the other stupid fools who kowtow to the Director. In less than a month everyone who doesn't believe will be dead. The Master himself has said so. Now get to bed."

I turned out the light.

Everything was working swell!

PRESIDENT VIRGIL GORHAM, of the University, expressed no surprise at my request for an indefinite leave of absence. I wanted to make some

investigations necessitating the use of manuscript material scattered all over the world, I told him. In fact, he was effusive in his desire to accede to my request. I could start at once, he declared. Nothing must stand in the way of such a laudable bit of research.

I kept a straight face. I knew that the agents of the Deseco had already been to see him. No obstacle was to be placed in my path. I was the decoy, the stool pigeon, who was to lead them to the Master.

On the way home, a young instructor in biology fell in step with me. We spoke of inconsequential things as we crossed the campus. There were students swarming all over the place. But instead of quitting me at the edge of the field he kept on walking alongside. He was a nice young fellow and, as I had had occasion to find out, somewhat cautiously liberal in his tone. I had even seen him stifle a bored yawn during one of the compulsory Sunday Assemblies.

We came to an open stretch of park. It was deserted. Young Kent came closer to me. "Say, Martin," he said casually, "have you been hearing all this nonsense about a man from Saturn?"

"A little," I said noncommittally.

He thrust me a swift side glance; then stared directly ahead. "It's a lot of nonsense, isn't it?"

"Maybe yes; maybe no," I said.

"Hm-m-m! I agree with you. I mean—it's hard to believe there's even life on Saturn; much less a super-race who could send a representative to interfere in Earth's affairs."

I kept silence.

"Hm-m-m!" He thrust me that quick look again. He seemed baffled; yet he was brimming over. I knew he'd say more.

"Funny thing, though," he added.

"What is?"

"Of course it's nonsense, but I met a man yesterday who claimed to have seen the Master with his own eyes."

"Who?"

"Well, it was Giles." Giles was the man-of-all-work in the biology labs. He had the strength of three men, but he wasn't very bright.

"Yes." Kent seemed a bit resentful. "Curious that a superman like the Master should choose to reveal himself to a fellow like Giles."

"A Saturnian may have different standards from ours," I pointed out. "But was Giles sure he saw him?"

"Absolutely. He was bubbling with it; had to tell someone. I suppose he thought I was safe. Asked me particularly not to mention it to a soul; didn't want the Deseco to pounce on him."

I refrained from what would have been an obvious remark.

"Yes, sir, Giles saw him yesterday evening, down near the river," Kent went on. "The Master just materialized out of thin air, he claims." The young instructor laughed indulgently. "Of course, Giles is the kind of chap that would think that. Naturally, it must really be a type of space travel: the type the Saturnian used to get to Earth."

"Naturally," I echoed.

"Anyway, Giles said you could tell he wasn't from Earth. He was twice as tall as a man and his clothes were a shining, flexible metal. They had quite a conversation. According to Giles, the Master had decided to wait until next month before using his super-weapon, so as to give people a chance to show by their actions that they didn't want the Director themselves. He explained the weapon to Giles, but of course Giles wouldn't retain much of the explanation. Something about its being

selective. It kills all those whose minds show they aren't fit for freedom; and—"

Kent broke off hurriedly. He looked at me. It was evident he thought he had said too much. He essayed an uncertain laugh. "Naturally it's all poppycock. Even if there were such a man from Saturn, he'll never be able to overthrow our noble Director."

"Well," I said judicially, "I don't know—"

We had come to the path that led to my house; and I turned in, leaving Kent gaping after me.

I felt satisfied inside. For, curiously enough, I had spoken to Giles only yesterday afternoon.

THE DESECO stuck to me like burs. Wherever I went, an inconspicuous agent trailed me. On the strato-

sphere liner to Great London, the waiter in Parisian, the polite hotel manager in Tomsk, the yellow man who jostled me in the streets of Sinopolis and muttered: "Sorry!"

Everywhere I went I was watched. Night and day. I didn't mind. I took sudden, unnecessary trips. Such as the one out into the Gobi. The swift run to Australia. The doubling back into the Congo and what was left of the old jungle. I wanted to see how efficient the Deseco was.

The Deseco was efficient. How they did it, I don't know. But a chubby tourist materialized in the Australian bush. A lean Tatar rode an old-fashioned horse over the stony Gobi. A black man hired himself to me to tote my traveling bag in the Congo.

Yet I never led them to the Mas-

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ter. Every time I left some place in a hurry, they were sure this was the time. That trail's end was in sight I encouraged the belief. I looked behind me furtively, as if to spot possible shadowers; and never, of course, realized that the pretty woman who chatted and flirted with me was the one I should fear.

Oh, I had a swell time!

I covered the world. My aimless peregrinations had definite purpose. In most places I found that news of the Master had preceded me. I listened, and dropped hints. I sowed rumors. I had heard so and so from a man, I said. I described the man from Saturn in artful phrases. I spoke vaguely of the Fourth of July. I even told the pretty woman agent about it. She was eager to know more; if she, too, could meet the deliverer. I dodged her with clumsy evasions.

I attended the Sunday Assemblies wherever I happened to be, as was indeed compulsory. The Director, three-dimensional, spoke softly, soothingly. The hypnosis rays pervaded the auditoriums. His eyes were serene, and persuasive. The drugged words slid into the minds of the people.

But I noted something increasing as a June of Sundays moved to a close. A certain restlessness among the dupes. A stiffening of resistance to the hypnotic sway. A counterirritant to what had envel-

oped them so long. Whisperings, in spite of the sudden appearance of the Circle Guards. Resentful faces when a too-loud whisperer was pounced upon and dragged away.

The rumors fled before me. Where they hadn't come as yet, they swelled behind me. Strange, the speed with which rumors travel. Sometimes I wonder if they aren't as fast as light. Certainly they move with a celerity exceeding that of any stratosphere liner.

Down in Patagonia, as I stepped from the liner, I stepped simultaneously into an excited, gesticulating crowd. It was the first I had seen like that. Circle Guards were as excited as any ordinary citizen. Even the agent of the Deseco, designated to meet me as I got off, was as flushed and gesticulating as the rest. Don't ask me how I knew he was a Deseco agent. Call it an intuition based on a long background of psycho-historical study. Call it what you wish. But I rarely make a mistake in sizing up a man.

I pushed deliberately toward him. This was unusual. Neither Deseco nor Circle Guards ordinarily permitted excited mobs. Mobs set up a hypnosis of their own.

"What's going on?" I asked him.

He stared at me. His face was flushed and his breathing came in shallow bursts. There was a glitter in his eyes. To my trained glance it was evident that there had been a terrible wrench to his conscious ego—a wrench that had destroyed some deep-seated pattern which had hitherto filled his mind.

"Haven't you heard?" he cried.

"Heard what?"

"The Master . . . the Master's just come to Patagonia. I saw him with my own eyes." He flung around to the rapidly growing mob for confirmation. "Didn't I, friends?"

An excited clamor of agreement boiled around us.

"The Master?" I echoed in surprise. "Yesterday I was in Bombay. They said he was there."

Someone yelled out: "He goes like the wind. He's no ordinary human being. Not even the Director can stand against him."

I buttonholed the agent. "What'd he look like?" I persisted.

"He's a giant—about fifty feet tall. He has a red beard and his eyes burn with blue flames. His hands are long and slim, and they have only three fingers. On the middle finger he wears a ring. As the ring flashes upon you it fills you with unutterable peace. Not like the drugged sensation you get when that damned Director rays you. He's a brutal tyrant, is the Director. To hell with him. Friends, I was a Deseco agent, and I know. I could tell you stories—"

An ugly roar arose. "Down with the Director! Kill him! The Master says so. By July 4th we must know who's for the Master and who's against."

I STEPPED hastily aside. Just how fast *did* rumor travel? Only yesterday, in Bombay, I had described the Master to a Hindu merchant in the market place. A fat, puffy merchant who had listened impassively to my description, and made no reply. It was a test on my part; a deliberate, scientific test.

For I had not really described the Master. I had concocted a new description—bizarre, incredible. One that I had never heard before. And here it had met me in distant Patagonia, faster-traveling than the plane that had carried me. Of course, it might have come by radio; but it was hardly possible. For the Director had strict control of every

means of communication, and even the mention of the Master's name meant sudden death.

I had stepped aside just in time. The friendly, commonplace salesman who had played bridge with me on the liner pushed purposefully through the crowd. His face was no longer friendly; it was set in a terrible mold. He walked straight toward the renegade agent of the Deseco, hand in pocket.

"Shut your mouth, you fool!" he snapped. "And come with me."

The agent whirled on him. His eyes dilated. His finger pointed accusingly. "Look at him!" he screamed. "I know him. He's the Deseco man from India. He's a minion of the Director. He—"

I didn't see anything emanate from the newly arrived agent's pocket. Short-wave vibrations are invisible. But the renegade screamed suddenly and fell writhing to the ground.

The Indian agent didn't even look at him. His voice rose coldly. "Circle Guards! Arrest these swine. Take them all to Headquarters."

But the Circle Guards did not move. They stood stony still. The crowd, however, did move. And they moved with a speed that shocked me with its ferocity. An animal snarl moaned from their lips. They fell upon the astounded agent in a pack. He killed three; and then he was down—a screaming, mangled mess of blood and flesh around which the mob growled and swarmed.

I felt suddenly sick, and turned away. It had been terrible. It was revolution!

FROM THAT DAY ON I prudently decided to vanish. It was no longer healthy to play tiddlywinks with the Deseco. Things were moving too fast. By this time the Director

would have wearied of my wild-goose chases. He would know that I had no intention of leading his minions to the Master. Being a very clever man, he would do something about me, and do it fast.

This business in Patagonia, therefore, was my opportunity. Both the agent who had followed me and the agent who was to take over had died. Even a super-efficient organization couldn't cope right away with such a situation. Especially when revolt had begun.

Not that the revolt was anything more than a beginning. There were still plenty of Circle Guards and Deseco men who did the Director's bidding. By the end of the day they had converged on the troubled tip of South America. A thousand rioters died on the spot; ten thousand more were hustled away into the unknown. Quiet reigned!

But it was no longer the obedient quiet of several months ago. It was the superimposed quiet of an unmasked and brutal dictatorship. The long, hypnotic spell was broken. The survivors went as before to the Assemblies, but they went sullenly, resisting in the depths of their minds, ready for another spark to touch them off.

The spark of the Master!

The man from Saturn!

He who was about to liberate the world from the suddenly loathsome reign of the Director!

I had taken advantage of the turmoil and the snapped threads of the Deseco to shift feverishly into disguise. In the matter of disguise I had long before determined that the bolder it was the better its chance of success.

Therefore I became a Deseco agent, with credentials which I had managed to filch from the pockets of the Patagonian who had died. A

few indelible marks to change the contours of my face completed the job. Nothing elaborate. Elaborate disguises usually defeat themselves in the end.

Thus armed, I flew boldly back to Megalon on a small, slow-moving air freighter. There was nothing more I could do. And I wanted now to be dead in the eyes of the Director; one of those blasted to bits in the Patagonian riot.

I had done the Master's work as best I could. I had dropped foci of infection all over the world. These foci had spread and coalesced with incredible speed. Men appeared now in great cities, in remote mountain districts. They, too, were disciples of the Master. They, too, had seen the super-liberator, so they proclaimed; and they exhorted their fellows to rise against the Director.

The deadline was July 4th. On that fateful day the sheep would be separated from the goats. The Master would act; but the people must act first. Otherwise the Master would decide they were slaves, with the mentality of slaves. He would cleanse the Earth of Director and slaves alike. The new order of things would be only for the strong, the worthy, those capable of self-sufficient freedom.

The agitation was no longer in whispers. It spread like a prairie fire; it raced before the wind. I heard about it in my secret retreat close to the strongholds of the Director, and was glad. The Master had many disciples now. I was but one among thousands. With me were Helen and little Jacky. With infinite care I had smuggled them out of our home right under the very spy instruments of the Deseco. I took no chances on a sudden stroke of vengeance by the Director.

Not that he didn't have many other things on his mind. He wasn't taking all this lying down. When

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he realized that his hypnosis waves were meeting with strong counter-hypnoses, like a sensible man he shifted tactics.

Bands of highly trained Circle Guards, mechanized and mobile, made swift forays to the worst points of infection. Thousands died in the cold, methodical destruction of cities. Thousands more lingered in concentration camps. Millions fled screaming from the approach of the units. Terror, bloody and unabashed, roamed like a wild beast over the Earth.

I HEARD of all this in my well-concealed mountain retreat and felt a sick feeling in the pit of my stomach. Was the Master then not as mighty as I had conceived him to be? Or was the Director more ruthlessly clever than even I had thought?

It was the first day of July.

Within three days there would be a final showdown. Either the Master would triumph, or the world would sink back into the slavery it had known; indeed, a far worse, far more brutal slavery than before.

Within three days!

I moved restlessly about the rather elaborate underground shelter I had been careful to prepare well in advance. In my holidays I had prepared it, deepening and widening some natural caves I had discovered in my mountain-climbing jaunts. It was ideally situated.

The spur of the mountain range into whose flank it penetrated commanded a double view. To the south, well within unassisted vision, hung the stronghold of the Director. Many a time, during those last few days, I had crawled cautiously from the well-hidden entrance to my retreat and lay motionless among the leafy underbrush, studying those grim walls, the gray, straight up-thrust of them. Behind them, silent

though they seemed in the dancing haze of July, I knew there was feverish activity. The mounting of great engines of destruction, the triple reinforcement of the already impenetrable protective screens against the well-advertised advent of the Master.

No human forces, no waves of desperate men with weapons in their hands, could possibly avail against those defenses.

But against the Master? I did not know. He had new weapons of offense—I knew that much. Weapons which human beings as yet had used haltingly and with a certain crude success. Terrible weapons—irresistible, I hoped.

I stared across the intervening valley and reflected that no defenses, no matter how perfect, were any better than the men who handled them. It was true that the Director had gathered against the coming menace his most trusted Pretorians and the best of Deseco and Circle Guards alike. But I remembered the Pretorian who had escorted me back from that fateful interview with the Director; I remembered the Patagonian agent and the Guards who had surrounded him; and I took some comfort from my thoughts.

And the Director himself. Superbly clever as he was, it was hard for human flesh and human brains, no matter how steeled, to await the onslaught of an unknown, hitherto invisible antagonist. Especially when the date of his coming had been announced on a thousand thousand tongues. Especially when the weapons at his command were likewise unknown, yet proclaimed in advance as superhuman and irresistible.

Adolf Hitler, back in 1940, had first evolved this particular technique of demoralizing nations on the

defensive. His technique had been crude, fumbling; yet even so it had proved terribly effective.

To the north, spreading wide over the level plain, glowed the great city of Megalon, capital of the world. Ten million people inhabited its huge towers and airy apartment blocks. Ten million people who stirred restlessly under the promise of the Master and stared with hate-filled eyes toward the heights where the Director was.

LITTLE JACKY gurgled and played contentedly inside the cavern. He toddled on fat legs through the series of chambers, crowing with delight, and making those queer sounds which Helen and I were sure were meaningful words. I permitted him the run of the place, except for one end chamber which I had sealed off, not permitting even Helen to enter. In there were weapons, I explained, dangerous for children and untrained women to handle.

Helen was worried. She tried to carry on bravely, but the strain was telling.

"We can't stay here forever," she said.

"No," I admitted. "But after the Fourth—"

She broke down then. "I'm tired of hearing about the Fourth of July," she cried. "I don't believe in it; I don't believe *anything's* going to happen. The Master! The Master! That's all I hear wherever I turn. I'm beginning to think this superman from Saturn is a myth. I don't believe he even exists!"

"Helen!"

She saw the shock written plainly in my face. I was trembling; frightened, even.

Instantly she was remorseful. "I . . . I'm sorry, darling. I know

you've seen him yourself. It . . . it's just my nerves, I suppose."

I patted her warm-glinting hair; kissed her. "Others have seen him, too," I said. "Thousands by this time. All over the world. They all agree—"

For a moment her mood reasserted itself. "They don't agree, darling. Every time I hear about him I get a different version. First he was like a man, a little taller and a little more majestic. That's the way he appeared to you that day on the mountainside, didn't he?"

"Yes."

"But now he's as huge as a building; he is clothed in shining metal; he is clothed only in the wonder of his beard; his color is red; his color is the blue of the sky; he has three-fingered hands; he has no human limbs." She buried her head on my shoulder. "How can one believe such ridiculously variable accounts? If you hadn't seen him with your own eyes, my dear—"

I held her tight. "All eyewitness accounts are like that," I told her earnestly. "As the wife of a man who has devoted most of his life to the application of psychology to historical data you ought to realize that. And especially when the thing they see is so startling and novel. The wonder is that the accounts don't vary even more than they do. I'll grant you even," I added, "that some of those who are the loudest witnesses saw nothing. There are induced visions, familiar to every practicing psychologist. Oh, the people who have seen them are honest enough. They actually *think* they have seen what they describe. But the visions are merely the projected hysterias of their emotionally insecure minds, generated by the universal belief."

"I suppose so," she said at length. "Very likely that accounts for the most preposterous descriptions."

I was limp and shivering for some hours after that. But I gradually calmed down. After all, Helen had always been that *rara avis* among women—an intellectual skeptic.

THE NIGHT of July 3rd was a restless one for me. I didn't even try to sleep. Luckily, Helen was pretty much exhausted and she slept deeply, so I didn't disturb her. She didn't hear the comings and going of my restless feet.

July 4th dawned warm and breathless. Even within the deep-delved caverns it was hot. Outside, the sun rose in a burning ball and the air sweltered and swooned. A heavy silence hung over all nature, as though the Earth was holding its breath against the advent of the Master, come to fulfill his promise of liberation to the oppressed peoples of this world.

We stared out at the peaceful scene—Helen and I.

"Where is he?" my wife demanded. Her voice had a queer, choked sound.

"I don't know," I admitted. "It's early yet. Perhaps—"

Again I turned my eyes toward Megalon. I couldn't understand it. Had human nature changed overnight? Was psychology no longer a science? Could it be possible that—

A noise like a gathering wind came from Megalon. A noise as of millions of scuffling feet and millions of angry voices.

"Ah!" I said.

"What is that?" cried Helen, whirling toward the plain.

But even as she spoke the noise became a clamor, and the clamor a tremendous roar. The floodgates

opened. Like a storm-lashed sea the people came running, surging out from the great city, spreading like undiked waters over the huge flat plain. Thousands of them, millions of them, tens of millions! More than had ever dwelt in Megalon; more than had ever dwelt in all the central area. Men from all the nations, men from the distant continents, men with weapons in their hands and a rapt fanaticism on their faces.

I smiled then and felt a great contentment course through my veins. Psychology was still a science! All through the darkness of the night they must have gathered, hurrying to Megalon by stratosphere and land and sea, come to witness the smashing of the Director by the terrible might of the man from Saturn.

Bands of Circle Guards swooped down upon them in great warplanes; other bands unlimbered their deadly field weapons. Huge swaths scythed through the people's ranks; but on they came with eager clamor and a blood lust in their voices. The Guards made a stand; the planes swooped low. But the people were not to be denied. Weapons blazed and the ground shook. Deadly vibrations crossed and recrossed. Then the ranks closed up and flowed on triumphantly. The Circle Guards were no more.

"The . . . the Master must be leading them!" Helen cried breathlessly. "They're going to storm the Center."

I did not answer. My eyes were turned anxiously toward the stronghold of the Director. Behind those grim straight walls what was happening? Their sullen, watchful silence mocked me.

On and on raced the gathered nations of Earth. It was frightening, superb. Man by himself is a puny animal, naked and helpless in his shivering aloneness. But joined with

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his fellow men, swarming in multitudes, moving in resistless tide, he is a terrible creature before whom the very mountains shake and the paths of the heavens split to give him passage.

They foamed past the spur from whose slope we watched and boiled on toward the mountain wall on which perched the stronghold of the Director. It was breathless, awe-inspiring; but—

AGAIN my eyes clung to the silent heights. There were millions on millions of men to the attack; but I knew the defensive weapons of the Director. The sweat started on my face, ran in rivulets down my body. If only I had eyes that could penetrate stone and mesh vibrations! If only I could penetrate within those walls and see for myself the Director and his Pretorians! Were they—

As if in answer, a terrific scream made the former multitudinous noises sound like deathly quiet. The attackers had boiled up against the mountain base. They started to clamber up the stony paths. There was a blast of flame; a crackling, roaring sheet that swept aloft like a solid wall to the very heavens. Within that fiery blast uncounted thousand crisped and flashed to blazing extinction.

I clenched my hands until the blood spurted from nail-scored palms. The Director had acted! The Pretorians were loyal!

Helen shaded her eyes with up-flung hand to keep away the awful sight. "The poor, poor people!" she sobbed. "Where is the Master? Where is his boasted power?"

But I had fled; fled into the interior of the caverns, sobbing myself with breathless hurry. Yes, where was the Master? He had to appear! Had to, I told myself with fierce repetition. Yet even if he did, could he turn the tide? Were both Di-

rector and his cohorts impervious to the peculiar might of the Master?

I came out again in a little while. I found Helen moaning and shuddering with horror, yet unable to tear here eyes away from the shambles below. Oh, the people were brave enough. They yelled and shouted and surged forward again and again at the mighty defenses that enveloped the stronghold. Their weapons blazed and crackled and spat a deadly hail. They flung their bodies into the invisible wall of vibrations, as if to exhaust its gigantic energies with the holocaust of their flesh and blood, and permit the clambering millions behind to pour through the gap.

But the thousands died, and the screen remained intact. High above, secure behind that terrible defense, the Director appeared calmly on the wall. His form was dwarfed by distance, yet to my heated imagination it seemed I could detect a derisive smile upon his face. He was afraid neither of the peoples of Earth nor the man from Saturn. If there *were* a man from Saturn!

Already the fanatic multitudes were falling back in despair. A huge wail burst from them. Where was the Master? Had he led them on to this, only to desert them?

Little pulses hammered all over me. Yes, where was he? He should have come by now. Had anything gone wrong?

Then I sucked in a deep, gasping breath.

"Look!" I shouted insanely, as if my voice could beat down the million-throated clamor and penetrate their bewildered brains. "Look!" I yelled. "The Master! He has come! He has come!"

They saw him almost as soon as I did. A sudden hush fell upon that torn and bleeding multitude.

Even the vibration wall died into invisible quietude. All nature seemed to stop and watch.

He walked in the air, high above the frozen people, level with the grim gray walls of the Center. He was clothed in light and misty radiance. He was gigantic and terrible. His face was a blur of awful anger. His moving feet churned the impalpable air into a spectrum of flashing colors. His arm was outstretched in accusation as he walked, slowly and steadily, toward the Director!

Helen was shivering against me. I myself was in a fever, so that I could hardly see.

"The Master!"

"The man from Saturn!"

"He has come!"

Scattered cries rose from the more daring. The cries coalesced and swelled into a single earth-shaking roar.

"The Master!"

Then there was silence again. Even the wounded and the dying stopped their moaning and turned desperate eyes against his progress.

I dared not look. Yet I had to. I forced my eyes around, focused my dancing vision on the Center.

The Director was a brave man. I must say that for him. He stood erect upon the wall, facing the awful thing that walked the impalpable air toward him. He called out in stentorian tones, so that his voice drifted over the intervening distance and I could hear.

"Man or devil or being from another planet, it doesn't matter. He cannot penetrate the screen. He's flesh and blood. Shoot him down, men; shoot him down!"

The Pretorians had come thronging to the wall at the sight of the Master. They stared and stared and

their bodies were huddled. I managed somehow to pluck the tiny spy visor from my pocket. It wobbled in my hand as I trained it upon them. Somehow I steadied its jittery arc.

The Pretorians were frightened. Their eyes bulged and their mouths were agape.

The Director turned on them with lashing contempt. "Fools!" he cried. "He's flesh and blood, the same as you! Even if he seems to walk on the air. A simple scientific attachment could manage that. You fly in planes and great liners, don't you? Come to your senses. Use your weapons. Annihilate him!"

But the Pretorians shrank away. The sight of that gigantic figure moving with inexorable slowness toward them unsettled their reason. For months they had heard of him, whispered among themselves, wondered. And now he was here. They were paralyzed.

THE DIRECTOR cursed them. He ran toward the nearest snouting gun. He swung its yawning orifice directly upon the approaching Master. He touched a button.

I held my breath. There are two types of weapons like that. One uses explosive tetratolol; the other disintegrating vibrations. Which was this?

There was a blast and scream of sound. The mountain enveloped in thundering flame. The moving figure submerged in smoke and exploding missiles. I released my breath.

The smoke cleared; the flames died away; the whining fragments rained to earth.

And the Master moved calmly forward. Intact, unharmed, impervious to that hell of shot and sound.

A tremendous cry burst from the plain. An answering, despairing cry broke from the Pretorians.

The Director looked staggered for a moment. Then he spun on his heel, rushed toward a second weapon. "Fool that I am! Tricked; betrayed! I should have known! But now I know—"

He heaved furiously at the great gun on its floating mount. He trained it on the still-advancing figure. I felt my heart stop suddenly. Was this the other type—the vibrator?

His hand moved toward the button, and I sobbed aloud. I cowered against what was going to happen.

Helen cried sharply: "What's the matter, John?"

On the walls of the stronghold the Pretorians sprang into life again. Fear flamed in their eyes; fear of the wrath of the Master; quick, leaping hatred for the Director whom they had served in blind obedience. Their short-wave projectors came up. They made no sound; they flashed no danger signal. But the Director crumpled suddenly, his finger stabbing wildly for the button. It missed contact. He fell in a sodden heap.

Release came to the Pretorians then. They flung down their weapons and cried out imploringly to the inexorably nearing Master. They scattered like frightened sheep. Some ran to turn off the current that activated the screen; others fell in a frenzy of demolition upon the still-pointing armament. Others beckoned to the multitude beneath in token that they had joined themselves with the people. Some fell on their knees and begged forgiveness.

The thing had happened so fast that the swarming plain was still stunned and motionless. I threw

down the spy visor, thrust my hand against my side in a convulsive gesture. Helen was stammering incoherent words.

The Master stopped short just this side of the defensive screen even as it was lifting. He spread his hands out over the people in a gesture of seeming benediction. Everyone was kneeling now; plain and Center alike. A vast hush brooded over Earth.

But he said nothing. He gestured again; his gigantic frame slanted upward. Slowly at first; then with gathering speed, shooting high into the blinding glare of the sun until he vanished.

Helen clung to me. "He's gone! He's done his work and gone back to Saturn! He shouldn't have done that, John. He should have stayed and received the thanks of the people he freed from oppression. I wanted to ask his forgiveness. I doubted him. I confess it now. I didn't believe in him. I wanted to tell him so in person."

I patted her head. My voice was a little unsteady. I wouldn't have been human if it had remained calm. "That's why he had to go, darling; so that no one could thank him in person."

She turned her face toward me. "What do you mean?"

I took a deep breath. "There was no Master! There was no man from Saturn! What you saw just now was a simple three-dimensional projection on a screen of air such as you've seen dozens of times in the amphitheaters. If anyone had been able to keep his head, he would have realized that." I shuddered. "The Director did. That's why he tried to use the disintegrator. Its wave interference would have dispersed the Master like a dream. Luckily the Pretorians acted first."

"But . . . but . . . who did this?"

"I did. The apparatus is rigged up in that sealed room inside. Re-

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member, where I didn't permit you to enter?"

Helen looked at me. There was a great light on her face. It embarrassed me. It isn't good for a man to see such worship on the face of his wife.

"John! John!" she whispered. "You were the Master!"

"Yes."

"Oh, my dear—"

"It wasn't anything much," I interrupted hastily. "Just the application of a few elementary psychology principles. After all, that's how the Director himself got control. I knew if I preached open rebellion, giving good, sound arguments for it, nobody would pay any attention except the Deseco. But a man from Saturn, that's something else again." I shook my head. "It frightened me at times—the power of rumor. Drop a few mysterious words here and there, and they spread like fire in stubble grass. Whereas all the arguments in the world, all the logic, die in their very birth."

"Are you going to tell them?"

My arm went around her. Little Jack toddled blinking from the cave; gurgled sounds I fondly imagined made sense. I picked him up, held him in my other arm.

Down below, there was mad festival. To the ends of the horizon plain and city and Center and valleys were a black, weaving, yelling, joyous welter of humanity. Freed from the nightmare hypnotism of many years; once more citizens of a new and more glorious Earth.

I shook my head. "No," I said. "Sometimes myths are good for man. Let them remember the man from Saturn—the Master—even as they had seen him in his final moment of triumph."

My arms tightened around these two.

THE END.



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